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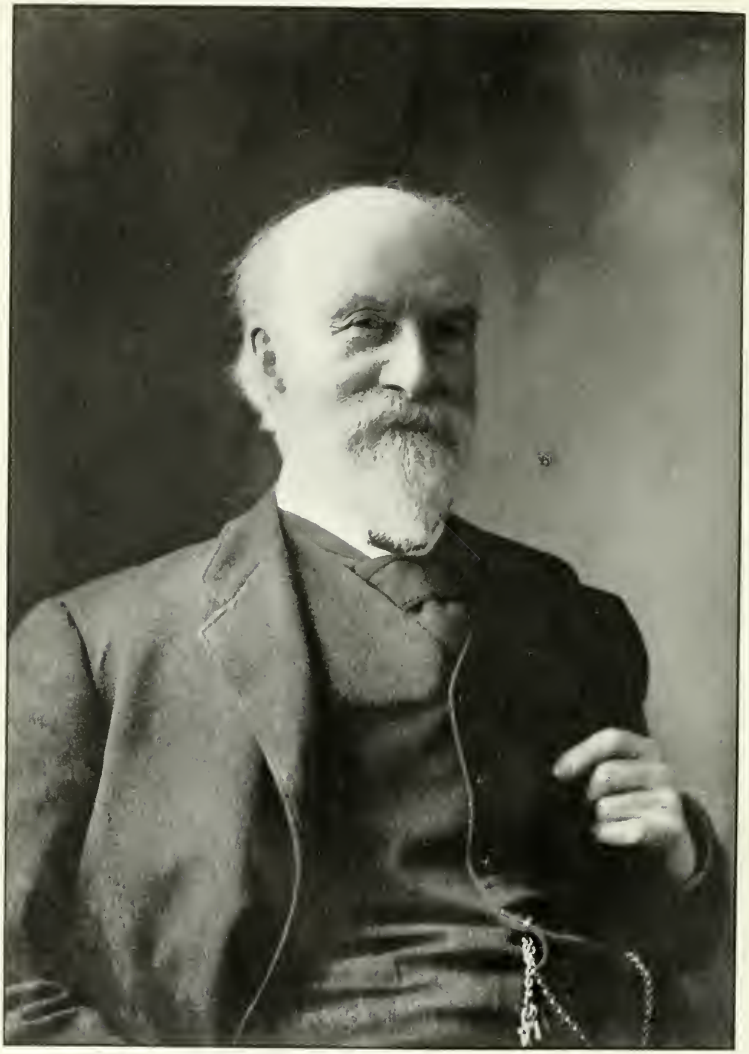

SIR SANDFORD FLEMING

CANADIAN ALPINE JOURNAL

Vol 1

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CANADIAN ALPINE JOURNAL

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CANADIAN ALPINE JOURNAL.

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Vol. I. THE ALPINE CLUB OF CANADA. No. 1

GREETINGS

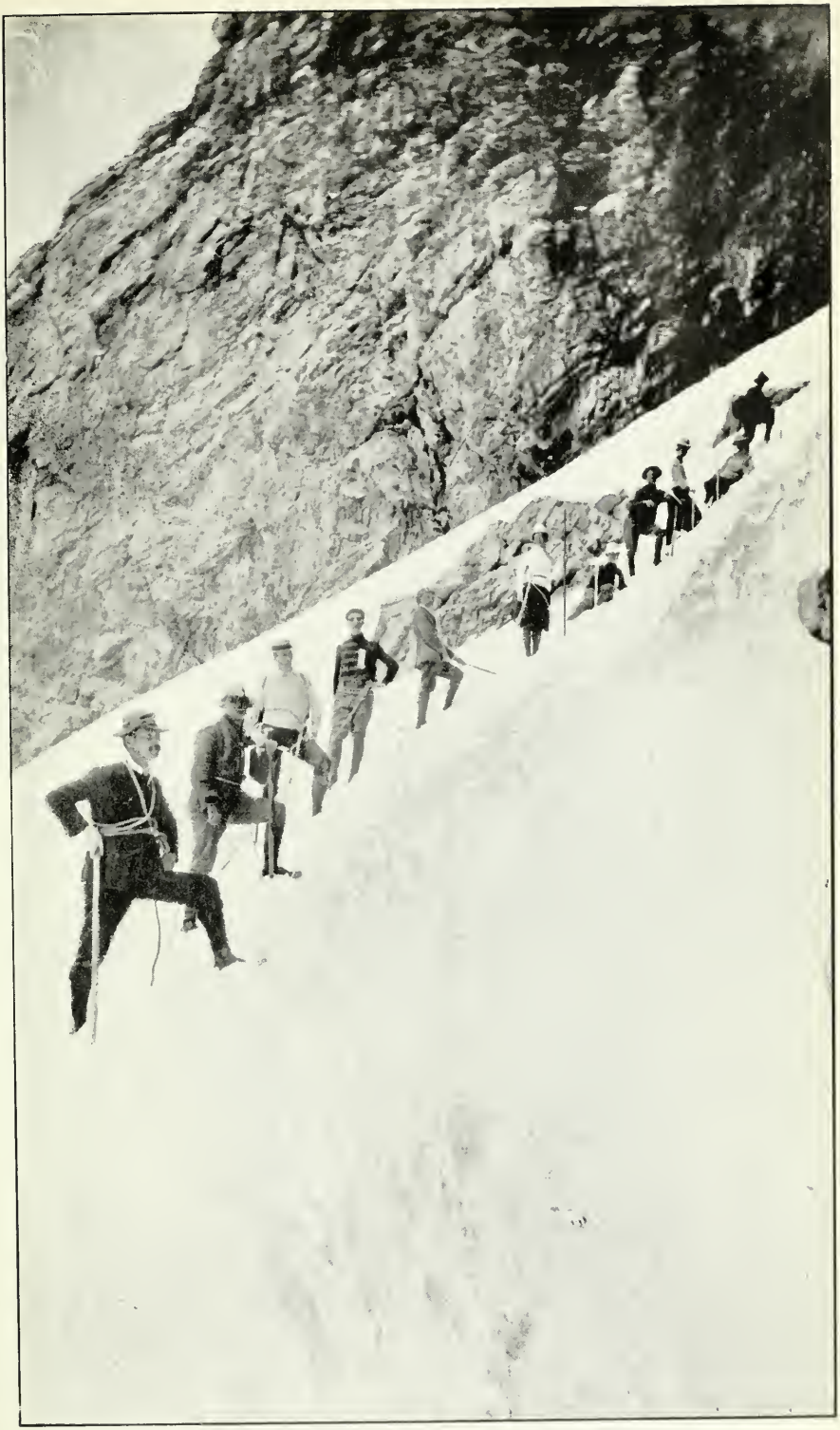
By William Whyte

The opening of the Alpine Club's Season of 1907 is awaited with the most pleasurable anticipation by great numbers of whole-hearted and patriotic Canadians. That the coming Season will be an epoch in the history of the Club is my firm conviction. With its large membership and loyal adherents all, awaiting eagerly the time when they may be permitted to try conclusions with the glorious peaks and mountain passes in our great West, the Club has, within itself, the quality of unlimited success.

With my early experiences in the Canadian Rockies, I could, perhaps, speak with authority on the subject of our wonderful mountain ranges, but the time and space at my disposal would not permit of my doing full justice to them. I might say, however, that although countless books and articles have been published in laudation of the Canadian Rockies, a great deal has been left unsaid.

When one considers the personnel of the Club and the field they have chosen for their outing this season, one cannot help but prophesy that the Camp this year will be a great success, and I cannot too strongly urge all of our young Canadians to attend, when the opportunity will be afforded them of climbing their own mountains and thus securing an appreciation of some of the beauties of their own country.

Much has been said and written about the Alps of Switzerland and about other great mountain ranges of the earth, but when the Canadian Rockies become widely known as these other ranges, I am confident that they will not be found second in the regard of all lovers of mountains and mountain-climbing, and I may say that the best method of advertising our mountains is first to have our young Canadians gain a thorough knowledge and appreciation of their heritage. The resultant pride in their heritage will quickly make itself known across the seas, and many will come, see, and be conquered. There may be those who will come to scoff, but they will remain—to praise.



A SNOW CORNICE ON MT. VICE-PRESIDENT.

THE ALPINE CLUB OF CANADA

By Elizabeth Parker

Its apologetic is summed in the second paragraph of the circular announcing the organization of the Club.

"The objects of the Club are: (1) the promotion of scientific study and the exploration of Canadian alpine and glacial regions; (2) the cultivation of Art in relation to mountain scenery; (3) the education of Canadians to an appreciation of their mountain heritage; (4) the encouragement of the mountain craft and the opening of new regions as a national playground; (5) the preservation of the natural beauties of the mountain places and of the fauna and flora in their habitat; (6) and the interchange of ideas with other Alpine organizations."

When the Club was organized in March, 1906, it was a red-letter day to some who had long felt the reproach of Canadian apathy to Canadian mountains. For, while English and American mountaineers had, year by year, seized the summers following the advent of the railway, and had explored and climbed—here and there a man with the "magic of the words" telling the story,—an increasing few of our own people had also been climbing for love of it. Thus learning of the immensities of the alpine regions of their own land, they became jealous for their compatriots' sake. Why should not mountaineering become one of our national sports?

Not until November, 1905, did any positive movement towards organization begin. The response from

all parts of the Dominion was a surprise, and ought to have been a rebuke to us who had loudly lamented Canadian indifference to a sport for which Nature had provided so vast a playground on our own immediate territory. We had awakened out of sleep, and would redeem the past by a vigorous mountaineering organization. But whatever the Alpine Club of Canada achieves of climbing, of discovery, of purely scientific work; whatever the Club may eventually become, it must never forget how great and splendid service, and affectionate withal, has been rendered to our mountains and Canadian mountaineering by the members of the Appalachian Mountain Club, the American Alpine Club, and the Alpine Club of London. They have done the work, and published the tidings in a series of publications that already make a considerable library of Rocky Mountain literature. When the Canadian Alpine Club was organized, it counted itself honored to confer honorary membership upon some representatives of these Clubs, and happy to receive others as active members. The first life-member on our list is Professor Herschel C. Parker of Columbia University, one of the boldest pioneers of them all.

What does the Alpine Club of Canada propose to do? Does it take itself too seriously? There may be learned cosmopolitan alpinists whose many years' experience of hardy holidays among the glaciers and upper snows of the mountain ranges of the world, would incline them to look with patronage, if not incipient scorn, upon an organized effort to popularize the exclusive sport. They might say that to popularize was to vulgarize. Not so. Mountaineering is too toilsome, too hard a sport, and demands qualities of mind and character quite other than vulgar. Many pastimes and sports, many vocations and avocations may become vulgarized. But it must be obvious to any who know ever so little about the glaciers and

névés and precipices—the unimaginable visions from the upper heights; it must be obvious that, from the very nature of the sport, to popularize mountaineering is not to vulgarize nor degrade it. The mountains themselves hold the high effort and achievement in fee. The vulgar reach the mountain summits by a way against which the Alpine Club of Canada will set a face of flint. We know what way that is: the way of the monster, Mammon. By virtue of its constitution, the Alpine Club is a national trust for the defence of our mountain solitudes against the intrusion of steam and electricity and all the vandalisms of this luxurious, utilitarian age; for the keeping free from the grind of commerce, the wooded passes and valleys and alplands of the wilderness. It is the people's right to have primitive access to the remote places of safest retreat from the fever and the fret of the market place and the beaten tracts of life. We are devoutly grateful, as we ought to be, that the Canadian Pacific Railway Company has shown itself wise in a national sense, by refusing to follow in the wake of the cog-railways of the Rigi and Pike's peak. Our associate member, Mr. Whyte, the Second Vice-President of the Company, than whom a shrewder man of commerce does not live in Canada, nor one with a clearer vision of the people's good, would deplore any wanton defacement of the wild natural beauty and grandeur of these now secluded fastnesses. If I had space I could give tangible proof of this.

It is the Club's business to support the picturesque and wholly enjoyable transit to the mountain-places by pack-horse and saddle, and to promote the too much neglected exercise of walking. Your true lover of Nature is also a man of the unfamiliar roads and forest trails. It would be a great thing for young Canadians if all the automobiles vanished into space and walking for pleasure became the fashion. As

soon as prudence will warrant, huts will be built in remote strategic situations for the convenience of the members, and persons put in charge for the season; bivouacs will be established on the long trails at distances of a day's journey, and the Club will co-operate, where possible, with the Railway and the Government, in making new trails, giving comfortable access to all the places already known or yet to be discovered. And it is the Club's business to support all measures towards preservation for all time of the fauna and flora in their wild habitat. All members are expected to be alert to this end.

First named among the reasons for the Club's existence is the claim of science: "the promotion of scientific study and the exploration of Canadian alpine and glacial regions." This clause makes its appeal to the exclusive class already referred to, whose work is of the schools, a thing apart from, though it may and ought to include mountaineering as an ennobling, ethical and æsthetic pastime. This section has a distinct work to do; and will, we hope, include a considerable number of men of science. And though much snow may fall upon the mountains and much water run in torrents from the glaciers ere it achieves its predestined high place in alpine and glacial science, its progress towards that consummation is in safe guidance. The President will look to that. He is keen for progress, and has withal, an appalling capacity for dogged hard work—and for making other people work. The Scientific Section is not likely to languish while Mr. Wheeler is alive.

Concerning the cultivation of Art, prizes are to be given for the best photographs; and as soon as circumstances will permit, a competition in oils and water colors will be opened for active members. A reliable guide-book, too which will include instruction on the details of mountaineering, will be published for the

Photo, Byron Harmon

ROLL CALL FOR THE OFFICIAL CLIMB OF MT. VICE-PRESIDENT

benefit of any who come to climb in the Canadian Alps.

There is nothing quixotic about the Alpine Club of Canada: it is a sane, sober institution, organized by sane, sober men. As indicated, its mission is manifold. The education of Canadians to an appreciation of their alpine heritage, is of itself a *raison d'etre.* The Canadian Rocky Mountain system, with its unnumbered and unknown natural sanctuaries for generations yet unborn, is a national asset. In time we ought to become a nation of mountaineers, loving our mountains with the patriot's passion. A great Canadian, who wore himself out for the love he bore to God and Canada, was wont to say that a country which could grow wheat could grow men, by which he meant a race made of the flesh-stuff and the soul-stuff that builds up nations. This is the composite human material out of which mountaineers are made. But the peril is, that men become satiated with wheat, and there follows that effeteness which is worse than the effeteness of an unbalanced culture. Among other correctives none is more effective than this of the exercise of the mountain-craft. No sport is so likely to cure a fool of his foolishness as the steady pull, with a peril or two of another sort attending, of a season's mountain climbing in one of those "thrilling regions of thick-ribbed ice" in the wild alpine playground of Canada. The ethical value of mountaineering is a subject upon which our statesmen would do well to ponder; and there is a considerable Canadian Alpine literature from which they may gather data.

Any young man of latent intellectual and moral force, who comes to close grips with the waiting, challenging mountains, and puts one summit after another beneath the soles of his feet, has gained immensely in the Spartan virtues. Moreover, he has,

by climbing to these skiey stations and standing face to face with Infinitude, learned some things he may not tell, because they are unspeakable. It is given to very few, to utter such experiences. But there comes to the mountaineer of pure mind and willing spirit the sense of which Wordsworth tells, of the presence interfused in Nature; the presence that dwells among the sheer peaks and in the living air and the blue sky and in the mind of man; the motion and the spirit that rolls through all things. Browning sums it in his swift way: "which fools call Nature and I call God." To this climber is given a key to many an utterance of the Masters, which else remained for him unlocked. It is quite true that every climber has not, nor may not acquire the philosophic mind that is curious regarding the divine interpretation of Nature; but traversing the sources of the great ice-rivers and breathing the virgin air above their mute snows is conducive to that philosophic mind. And whether or no, if that high exercise and that environment fail to arouse a sense of Nature malignant and Nature benignant, his case is hopeless as one who stands among men at the making of the nation.

One word more: the standard for membership may not be lowered. That it will be raised is almost certain; just as, with the progress of education, the standards for matriculation in a new university are raised.

Miscellaneous Section.

MEMORIES OF THE MOUNTAINS

By Sir Sandford Fleming

There is no record of any European having crossed the continent of America north of the Gulf of Mexico at an earlier date than one hundred and fourteen years ago. The idea of reaching the Western sea overland had fired the ambition of the men of New France for a hundred years and more. After long effort they succeeded in reaching a point within sight of the Rocky mountains, but a distant view of the gleaming peaks of that mighty range marked the utmost limit of their achievement. It remained for a Scotchman, a partner of the enterprising North-West Company of Canada, to gain the coveted honor. Alexander Mackenzie was born in Scotland in 1760, came to Canada as a young man, and at once threw himself into the hazardous service of the western fur trade. His restless ambition found little congenial in the commercial side of his occupation, but he eagerly seized upon the opportunities it offered for exploration. Always ready to engage in perilous enterprises, he discovered the great river of the north which springs in the passes of the mountains and bears the name of its discoverer. He was the first from Canada to reach the Arctic ocean. Not content with that notable exploit, he turned to the westward, penetrated the mountains, and reached the Pacific at Bella Coola, a point not far distant from the site of Prince Rupert, the recently selected terminus of the Grand Trunk Pacific railway. On a rock facing the tide water of the western ocean

SIR ALEXANDER MACKENZIE

he painted this simple memorial: "Alexander Mackenzie, from Canada, by land, the twenty-second of July, one thousand seven hundred and ninety-three." The record has long since disappeared, but the name of Alexander Mackenzie, the indomitable explorer, lives and will always live in the history of Canada.

Following in the footsteps of Mackenzie, another explorer, Simon Fraser, crossed the mountains and descended the river that now bears his name. The appalling difficulties of the journey would have frightened any less heroic heart. His men threatened to desert him. They urged him to avoid the almost impassable canyon by crossing overland to the Thompson river, but he replied simply that his orders were to explore the Fraser to the sea, and he would do that or die in the attempt. He succeeded, where many another would have failed.

From the days of Mackenzie and Fraser, the Rocky mountains have been penetrated time and again by explorers, fur-traders and travellers, from David Thompson, Alexander Henry, Gabriel Franchère, Ross Cox, Daniel Harmon, and Alexander Ross, to Sir George Simpson, Sir James Douglas, Paul Kane, the Earl of Southesk, Dr. James Hector, Lord Milton and Dr. Cheadle. All the earlier explorers were associated either with the North-West Company or with the greater company into which it was merged, the Hudson's Bay Company, whose vast commercial enterprises are recognized to have played an exceedingly important part in retaining our western territory within the limits of British North America.

The days when the fur-trader ruled an empire larger than all Europe have gone by. His realm is now in a different sphere. The railway has to a large extent taken the place of his brigade of prairie carts, his bark canoe or dog-sled. Many changes have occurred under my own eyes during the more than a

third of a century since my feet lightly trod for the first time the region of the mighty mountains, when I willingly accepted my first lessons in mountaineering.

It was in 1871 that the mountain region north of the 49th parallel became part of Canada. The importance of connecting British Columbia with the eastern provinces was at once recognized, and the stupendous task of building a railway from ocean to ocean was undertaken. Having been appointed engineer-in-chief, my duties soon led me to the mountains, and I have returned to them again and again, always with the same keen appreciation of their grandeur. My purpose here is to recall the past and revivify some of the impressions formed from personal observation, before the mountain region was made accessible to the people of the world by the completion of the Canadian Pacific railway. With this end in view, I do not think I can do better than select illustrations from the records of my early journeys. I purpose, then, to submit a brief reference to some scenes and incidents still fresh in my memory, under the following headings:

1. The Yellow Head Pass—1872.
2. The Kicking Horse Pass—1883.
3. The Rogers Pass—1883.
4. The First Through Train—1885.

The Yellow Head Pass—1872

My overland expedition of 1872 left Halifax on July 1st. We reached Prince Arthur's Landing (now Port Arthur) twenty-one days later. Following the route of the fur-traders, and travelling for the most part by canoe, we arrived at Fort Garry (now Winnipeg) on August 1st. Procuring horses, we crossed the plains to Edmonton; thence, after an exceedingly toilsome journey, we came under the protection of the Rocky mountains. It had taken from August 28th to the night of September 9th to reach the mountains

from Edmonton. I cannot now do better than turn to the diary kept, day by day, by my dear friend, the late Principal Grant, who acted as secretary to the expedition.

September 10th. We had come to the bases of the Rocky mountains and the sight of them was sufficient reward for all the toil of the preceeding fortnight. Curiously enough, as if to mark the occasion, we came into possession of "treasure trove" soon after we decided to camp for the night. A tent pole refusing to pentrate the ground more than about four inches, some blows from the axe were called for, to cut the supposed root of a sapling, but without effect other than blunting badly the edge of the axe. The hand of the axeman then felt for the obstruction, and with some effort drew out of the soil an ancient sword bayonet, the brazen hilt and steel blade in excellent preservation, but the leather scabbard partly eaten as if by some animal. It seemed strange in this vast and silent wilderness thus to come upon a European relic. How long had it lain where we found it? Are there many or any more bayonets embedded in this region? Its past history remains a mystery. It became part of our travelling impedimenta for the rest of the journey, and for nearly thirty-five years, which have since passed away, this "treasure trove" has found another resting place in my Ottawa home.

The Athabaska fell six inches during the night. Got away from camp at 7.30 a.m., and for two hours had a delightful ride to Prairie river. The trail ran along a terrace of shingle or alluvial flats, and was free from fallen timber and muskegs. Most of the flowers were out of blossom. Few, however, thought of plants to-day or of anything but the mountains that stood in massive grandeur, thirty miles ahead, but on account of the morning light, in which every point came out clear, seemingly just on the other side of each new

patch of wood or bit of prairie before us. They rose bold and abrupt five or six thousand feet from the wooded country beneath them—the western verge of the plains, the elevation of which was over three thousand feet additional above the sea,—and formed in long, unbroken line across our path. . . . The summits on one side of the Athabaska were serrated, looking sharp as the teeth of a saw; on the other, the Roche à Myette, immediately behind the first line, reared a great, solid, unbroken cube, two thousand feet high, a "forehead bare," twenty times higher than Ben An's; and, before and beyond it, away to the south and west, extended ranges with bold summits and sides scooped deep, and corries far down, where formerly the wood buffalo and the elk, and now the moose, bighorn and bear, find shelter. There was nothing fantastic about their forms. Everything was imposing. And these, too, were ours, an inheritance as precious, if not as plentiful in corn and milk, as the vast rich plains they guarded. For mountains elevate the mind, and give an inspiration of courage and dignity to the hardy races who own them and who breathe their atmosphere.

> For the strength of the hills we bless Thee,
> Our God, our fathers' God.
> Thou hast made our spirits mighty
> With the touch of the mountain sod.

The scene had its effect on the whole party. As we wound in long, Indian file along the sinuous trail that led across grassy bas-fonds under the shadow of the mountains that were still a day's journey distant, not a word was heard nor a cry to the horses for the first half-hour.

After dinner we resumed the march. . . . The view of the mountains all this afternoon more than made up for the difficulties of the road. Instead of being clearly

outlined, cold, and grey, as in the morning, they appeared indistinct through a warm deep blue haze.

September 11th. Away this morning at 6.15 a.m., and halted at 1 p.m., after crossing the Riviére de Violon, or Fiddle river. It was a grand morning for mountain scenery. For the first three hours the trail continued at some distance east from the valley of the Athabaska, among wooded hills, now ascending, now descending, but on the whole with an upward slope, across creeks where the ground was invariably boggy, and over fallen timber where infinite patience was required on the part of horse and man. Suddenly it opened out on a lakelet, and right in front, a semi-circle of five glorious mountains appeared; a high wooded hill and Roche à Perdrix on our left, Roche à Myette beyond, Roche Ronde in front, and a mountain above Lac Brulé on our right. For half a mile down from their summits, no tree, shrub or plant covered the nakedness of the three that the old trappers had thought worthy of names; a clothing of vegetation would have marred their massive grandeur. . . .

The road now descended rapidly to the valley of the Athabaska. As it wound from point to point among the tall dark green spruces, the soft blue of the mountains gleamed through everywhere, and when the woods parted the mighty column of Roche à Perdrix towered a mile above our heads, scuds of cloud kissing its snowy summit, and each plication and angle of the different strata up its giant sides boldly and clearly revealed. We were entering the magnificent jasper portals of the Rocky mountains by a quiet path winding between groves of trees and rich lawns like an English gentleman's park.

Crossing a brook divided into half a dozen brooklets by willows, the country opened a little, and the base and inner side of Roche à Perdrix were revealed, but

it was still an amphitheatre of mountains that opened out before us, and Roche à Myette seemed as far off as ever. Soon the Riviére de Violon was heard brawling round the base of Roche à Perdrix and rushing on like a true mountain torrent to the Athabaska. We stopped to drink to the Queen out of its clear ice-cold waters, and halted for dinner in a grove on the other side of it, thoroughly excited and awed by the grand forms that begirt our path for the last three hours. We could now sympathize with the daft enthusiast, who returned home after years of absence, and when asked what he had as an equivalent for so much lost time,—answered only, "I have seen the Rocky mountains."

Myette is the characteristic mountain of the Jasper valley. There are others as high, but its grand bare forehead is recognized everywhere. It is five thousand eight hundred feet above the valley, or over nine thousand feet above the sea. Doctor Hector, with the agent in charge of Jasper House, climbed to a sharp peak far above any vegetation, three thousand five hundred feet above the valley, but the great cubical block which formed the top towered more than two thousand feet higher.

The views this afternoon from every new point were wonderfully striking. Looking back on Roche à Perdrix, it assumed more massive proportions than when we were immediately beneath. A huge shoulder stretched up the valley, one side covered with bare poles, grey as itself, and the other with sombre firs. From it, the great summit upreared itself so conspicuously, that it filled the background and closed the mouth of the valley.

But the most wonderful object was Roche à Myette, right above us on our left. That imposing sphinx-like head with the swelling Elizabethan ruff of sandstone and shales all around the neck, save on one side where

a corrugated mass of party colored strata twisted like a coil of serpents from far down nearly half way up the head, haunted us for days. Mighty must have been the forces that upreared and shaped such a monument. Vertical strata were piled on horizontal, and horizontal again on the vertical, as if Nature had determined to build a tower that would reach to the skies. As we passed this old warder of the valley, the sun was setting behind Roche Suette. A warm south-west wind as it came in contact with the snowy summit formed heavy clouds, that threw long black shadows, and threatened rain; but the wind carried them past to empty their buckets on the woods and prairies.

It was time to camp, but where? The Chief, Beaupre, and Brown rode ahead to see if the river was fordable. The rest followed, going down to the bank and crossing to an island formed by a slew of the river. . . . The resources of the island would not admit of our light cotton sheet being stretched as an overhead shelter, so we selected the lee side of a dwarf aspen thicket, and spread our blankets on the gravel; a good fire being made in front to cook our supper and keep our feet warm through the night. Some of us sat up late, watching the play of the moonlight on the black clouds that drifted about her troubled face as she hung over Roche Jacques; and, then we stretched ourselves out to sleep on our rough but truly enviable couch, rejoicing in the open sky for a canopy, and in the circle of great mountains that formed the walls of our indescribably magnificent bed-chamber. It had been a day long to be remembered.

September 12th. We slept soundly our first night in the mountains, and after a dip in the Athabaska and breakfast, Valad went off on horseback to try the fords. Though the river had fallen six inches since last night, he found it still too deep for pack horses, and there was nothing but to construct a raft. . . .

All got over safely, though there was some danger on account of the strength of the current. . . . A ride of two miles took us to Jasper's, where we arrived exactly fifteen days after leaving Edmonton, two of them days of rest and a third lost by the obstruction of the Athabaska. It is hardly fair to speak of it as lost, however, for there was no point at which the delay of a day was so acceptable. The mountains of the Jasper valley would have repaid us for a week's detention.

Jasper House itself is one of the best possible places for seeing to advantage the mountains up and down the valley. It is situated in a pretty glade that slopes gently to the Athabaska, sufficiently large and open to command a view in every direction. There is a wonderful combination of beauty about these mountains. Great masses of boldly defined bare rock are united to all the beauty that variety of form, color, and vegetation give. A noble river with many tributaries, each defining a distinct range, and a beautiful lake ten miles long, embosomed three thousand three hundred feet above the sea, among mountains twice as high, offer innumerable scenes, seldom to be found within the same compass, for the artist to depict and for every traveller to delight in.

Valad informed us that the winter in this quarter is wonderfully mild, considering the height and latitude; that the Athabaska seldom if ever freezes here, and that wild ducks remain all the year instead of migrating south, as birds further east invariably do. The lake freezes, but there is so little snow that travellers prefer fording the river to trusting to the glare ice.

September 13th. The rain that had been brewing all yesterday came down last night in torrents. One awakened to find the boots at his head full of water; the feet of another, the head of a third, the shoulders of a fourth, were in pools according to the form of the ground, or the precautions that each had taken before

turning in. The clouds were lifting, however, and promised a fine day, and nobody cared for a little wetting; but everybody cared very much, when the Chief announced that the flour bag was getting so light that it might be necessary to allowance the bread rations. That struck home, though there was abundance of pemmican and tea. By 6.45 a.m. we were on the march again, to go deeper into the mountains. The trail led along Lake Jasper, and was so good that we made the west end of the lake, which is ten miles long, in two hours.

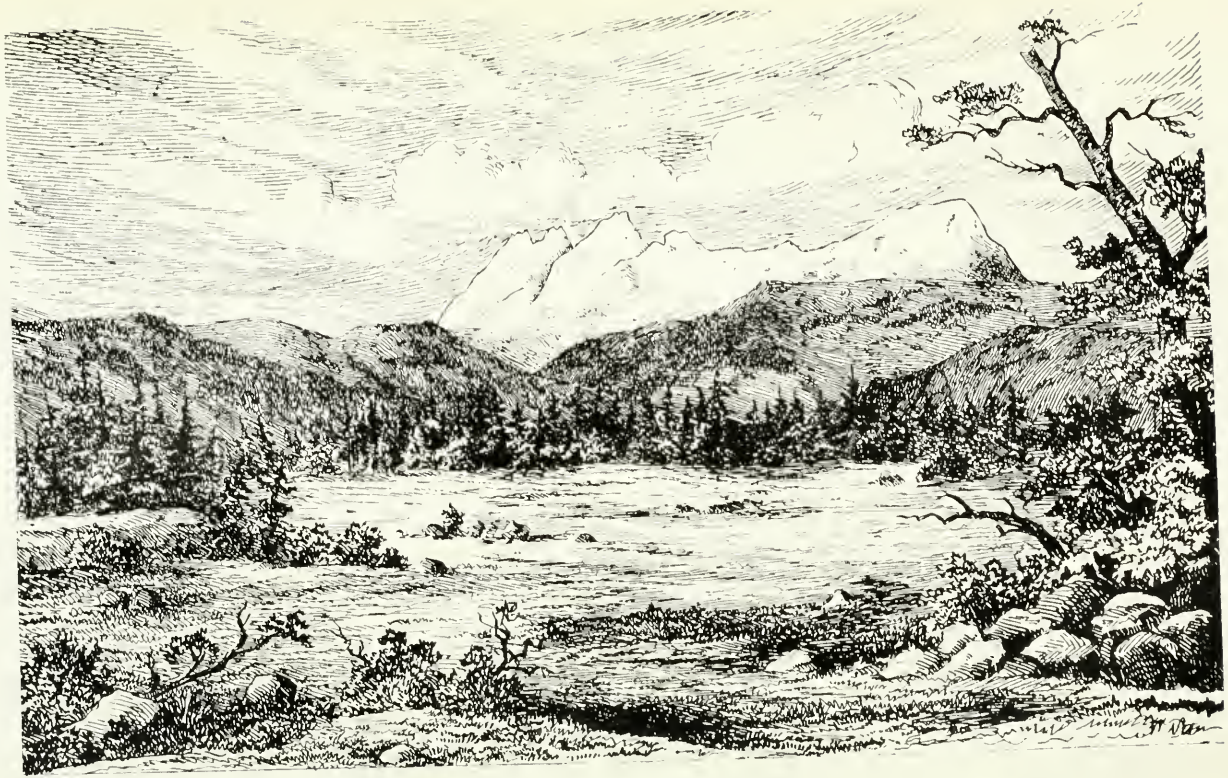
After dinner the march was resumed for seven miles up the valley. On the east side a succession of peaks resembling each other with the exception of one—"Roche à Bonhomme"—hemmed us in; while on the west, with lines of stratification parallel to lines on the east side, the solid rampart at the base of the Pyramid rose so steep and high, that the snowy summit behind could not be seen. The valley still averaged from two to five miles wide, though horizontal distances are so dwarfed by the towering altitude of the naked massive rocks on both sides, that it seemed to be scarcely one-fourth of that width. What a singularly easy opening into the mountains, formed by some great convulsion that had cleft them asunder, crushed and piled them up on each side like cakes of ice, much in the same way as may be seen in winter on the St. Lawrence or any of our rivers, on a comparatively microscopic scale, in ice-shoves! The Athabaska, finding so plain a course, had taken it, gradually shaped and finished the valley, strewn the bas-fonds, which cross-torrents from the hills have seamed and broken up. It looks as if Nature had united all her forces to make this the great natural highway into the heart of the Rocky mountains.

Sept. 14th. The trail this morning led along the Athabaska for seven miles, to where the Myette runs into it, opposite the old "Henry House." The highest

mountains that we had yet seen, showed away to the south in the direction of the Athabaska pass, and "the Committee's Punch Bowl." This pass is seven thousand feet high, and snow lies on its summit all the year round, but our road led westward up the Myette; and, as the Athabaska here sweeps away to the south, under the name of Whirlpool river, the turn shut out from view for the rest of our journey, both the valley and the mountains of the Whirlpool.

The first five miles up the Caledonian valley, as the valley of the Myette is called in the old maps and in Dr. Hector's journals, we made in about three hours, and a little after midday halted for dinner. . . . The Myette has a wonderful volume of water for its short course. It rushes down a narrow valley fed at every corner by foaming fells from the hillsides, and by several large tributaries. A short way from its mouth it becomes simply a series of rapids or mad currents, hurling along boulders, trees, and debris of all kinds. The valley at first is uninteresting, but, five miles up and for much of the rest of the way, is quite picturesque, two prominent mountains, that rise right above the pass and the lake at the summit, closing it in at its head.

September 15th. Left the "Caledonian Camp" at 8 a.m. for our Sabbath day's journey, and found it not much better than yesterday afternoon's, as far as quality was concerned. As every one needed rest and was tired of the Myette and its swamps, willows, and rocks, the call for a halt was hailed with general joy. . . . McCord had selected his camping ground judiciously. Good wood, water, and pasture in his immediate neighborhood; a beautiful slope covered with tall spruce, among which the tents were scattered; an open meadow and low wooded hills to the northwest, round which the low line of the pass, winding in the same direction, could easily be made out; and the



THE YELLOWHEAD PASS

FROM A SKETCH BY SIR SANDFORD FLEMING

horizon, bounded by a bold ridge which threw out its two great peaks to overhang the pass. This was one of the most picturesque spots in the Caledonian valley, combining a soft lowland and woodland beauty with stern rocky masses capped with eternal snow. We were 3,700 feet above the sea, but the air was soft and warm. Even at night it was only pleasantly cool. We were all delighted with this our first view of the Yellow Head pass.

September 16th. Our aim today was to reach Moose lake, twenty-four miles distant. The first half of the day was more like a pleasure trip than work. A gentle ascent brought us to the summit, which was found to be almost a continuous level, the trail following the now smooth-flowing Myette till the main branch entered the valley from the north, and then a small branch till it too disappeared among the hills. A few minutes afterwards the sound of a rivulet running in the opposite direction over a red pebbly bottom was heard. Thus we left the Myette flowing to the Arctic ocean, and now came upon this, the source of the Fraser, hurrying to the Pacific. At the summit Moberly welcomed us into British Columbia, for we were at length out of "No man's land," and had entered the western province of our Dominion. Round the rivulet running west the party gathered and drank from its waters to the Queen and the Dominion. There had been little or no frost near the summit, and flowers were in bloom that we had seen a month ago farther east. Before encamping for the night we continued our journey some twenty-six miles farther into British Columbia, well satisfied that no incline could be more gentle than the trail we had followed to the Pacific slope through the Yellow Head pass.

Among my memories of the mountains, I may here allude to a curious episode. We had a toilsome journey of about two weeks from Yellow Head pass to

Kamloops. About midway we came into possession of the head of the "headless Indian," well known to every reader of the "North-West Passage by Land." In 1863 Dr. Cheadle and his companion, Lord Milton, in the silent forest saw in a sitting posture at the foot of a tree a headless skeleton clothed in the leathern garments of an Indian. In vain they looked for the head, but all trace of it eluded their diligent search. When we reached the spot, nine years afterwards, the skeleton had been found by some of my staff precisely as described by Milton and Cheadle. After a careful search in all directions, the head was likewise discovered, about a hundred and fifty yards away from the body. While the mystery of its separation from the trunk will probably always remain a mystery, the history of the skull since its discovery in 1872 is easily told. It found its way to Ottawa along with the old sword bayonet unearthed in the Jaspar valley on the other side of the Yellow Head pass, but unlike the sword bayonet it soon came to an untimely end. The long-missing cranium of the headless Indian was accidentally cremated on January 16th, 1874, when the offices of the Canadian Pacific Railway Survey, at the Capital, were unfortunately consumed by fire.

The Kicking Horse Pass—1883.

My first visit to the Kicking Horse pass was in 1883, when on a special examination at the instance of Lord Mountstephen, then president of the Canadian Pacific railway. I was in London when I received his telegram from Canada. It hastened my return, and it likewise led subsequently to the publication in book form of the journal of a summer tour between Old and New Westminster. It may not be without interest to look back at the record of a generation ago, along the identical route by which the railway has since conveyed, in ease and comfort, hundreds of thousands,

and will continue to convey millions of passengers, through one of the great mountain regions of the globe.

Taking up the narrative at Calgary, the travelling party had hoped to learn at this place all that was then known of the territory to be traversed. We had reached the point on our journey where the accessories of modern travel ceased to be at our disposal. Before us lay the mountain zone to Kamloops, the distance across which, as the crow flies, is about three hundred miles. We failed to obtain any reliable information of the country through which we had to pass. Indeed, it was by no means a certainty that there was a practicable route through it. But it should not be forgotten that this uncertainty was understood to be the prime reason why Lord Mountstephen was so desirous that I should undertake the examination.

Before leaving the then canvas town of Calgary, I entered a tent where a printing press was in the act of striking off the first, or a very early issue, of the Calgary Herald, a journal which is still published. The day's journey brought us to "Morley," the home of the Stonies or Rocky Mountain Indians, where we obtained shelter. Next day, we proceeded nearly twenty miles, through a fine valley from three to eight miles wide, once the haunt of the buffalo, which a few years earlier, so we were informed at Morley, were numbered by hundrds of thousands.

The prairie diminishes as we advance, the valley contracts to half a mile. Evidently we are about to enter the portals of the mountains.* To the north, the bare precipitous rock is stratified and strongly contorted. The geological features are most striking and the exposure is on a grand scale. A great bluff rises almost vertical to a height of possibly fifteen hundred feet, and is about two miles in length. Four miles

* In this locality the industrial town of Exshaw is being established, where Portland cement is to be manufactured on a large scale.—April, 1907.

west, we are completely in the mountains, and every turn of the trail reveals new views of the grandest mountain scenery. Peaks towering behind and above each other come in sight, and the sun poured down its warmest rays, deepening the shadows and bringing out fresh beauties. The smoky air occasionally added to the landscape by developing the aerial perspective.

We pass Mount Cascade, so named from the small stream issuing from its side at the height possibly of two thousand feet, and descending direct to the valley. This mountain, the summit of which is said to be 5060 feet above the plain, is the most striking of the masses we have yet seen on the journey. Discoveries of anthracite coal have been made in its flanks, and from this fact the visitor of today will realize that the travellers had reached the neighborhood of what is now called Banff.

We learned from a party of engineers, encamped near by, that the prospect of getting through the mountains in front of us was not encouraging. They had never heard of any one crossing the Selkirk range. As they stated, "no one was known to have passed over from where we stood, by the route before us, to Kamloops; not even an Indian; and it was questionable if it were possible to find a route which could be followed." The information was unwelcome, but there was only one course open for us, and that was to proceed and ascertain the precise character of the difficulties, if there were any in the way.

We encamped for the night. Next morning, Sunday, the weather was really beautiful. The sun lit up in warm colors the great mountain peaks encircling the valley. The more distant peaks were invisible, but we had a remarkable view of the towering battlements to the north, in themselves so lofty and seemingly so near to us. We had a short service as usual, and as we anticipated a toilsome journey in front of us, we

resolved on a Sabbath day's travel in order to get hardened to our work. We rode about twelve miles up the valley between mountains of the most imposing grandeur. One peak crowned with perpetual snow is of striking beauty. Another has a cubical summit. A third, at no great distance, is pyramidal; and so on, in every conceivable variety. On the other side of the valley, we see Castle mountain, the resemblance of its features to cyclopean masonry doubtless suggesting the name. Night comes and we are soon wrapped in our blankets.

Next morning we are in the saddle again, when the sun is peering over Castle mountain. The ride is partly through burnt woods along the side of the river, and the smoke conceals to a large extent the outline of the mountains. Our party gets divided, one of the number taking a wrong trail narrowly escaped losing himself, at least for the night. At the end of the day, we ascend a glacier-fed stream and thus reach the summit, 5300 feet above the sea. Tonight we fall asleep on the continental "Divide." Hitherto we have passed over ground draining to the east. Tomorrow we follow a stream flowing into the waters of the Pacific ocean.

The descent from the summit, which has since received the name of Laggan, was by the Kicking-Horse valley, flanked by great mountains. It occupied four days to the upper part of the Columbia river, and proved to be a most toilsome journey. As is frequently the case in mountaineering, a dash of peril was occasionally encountered. The Kicking-Horse river, which has its source in a small summit lake near Laggan, soon gathers strength from many glacier sources, and flows with tremendous impetuosity, especially for the first six miles. The last ten miles passes through canyons, where the descent is most rapid, and the water, now of great volume, rushes downwards with

wonderful force before it falls into the placid Columbia. In the lower canyon, the water is forced through a rocky chasm, which from our point of view was of unknown depth. Where we stood the banks were overhanging. We encamped on the evening of the fourth day near the intersection of the Kicking-Horse with the Columbia, a river of considerable size in a magnificent valley several miles in width.

It is again Sunday, the first of September, which we devote to much-needed rest for horses and men. It is a beautiful morning, the sun lighting up the whole valley of the Columbia. The Rocky Mountain range which we have crossed lies behind us. The great Selkirk range lies in front. To the west and northwest, high peaks form a golden line of stern magnificence. Away to the south, huge areas of snow, possibly the accumulation of centuries, rest between the peaks. Amid all this grandeur we seek a few hours' rest to regain the vigor and elasticity which we shall need as we proceed on our journey.

In the cool of the evening we walk up the first gravelly terrace in rear of the camp to enjoy the view, ascending some five hundred feet. We were repaid for our effort. The huge mountains in our front and the valley stretching away in the magnificence of foliage to the southeast, lit up by the warm color of sunset, presented a noble landscape. I asked myself if this vast solitude would remain unchanged, or whether civilization in some form would ever penetrate to this region? It cannot be that this immense valley will always be the haunt of a few wild animals. Will the future now seeming to dawn upon us bring some change? How soon will a busy crowd of workmen take possesison, and the steam whistle re-echo where now all is silent? In the ages to come, how many trains will run to and fro from Ocean to Ocean, carrying millions of passengers? All these thoughts

crowded upon me in view of that peaceful scene, lighted by the last rays of the sinking sun as it dropped behind the Selkirk mountains. I do not think that I can ever forget the sight as I then gazed upon it.

The Rogers Pass—1883.

It was in the valley of the Columbia that I first met Major Rogers. We all enjoyed the hospitalities of his camp when we emerged from the toils of the Kicking-Horse valley. Here we remained from Saturday night until Monday morning.

Refreshed and prepared for the journey before us, we were up early, and at eight were in a canoe floating down the Columbia. We had 20 or 30 miles to go in this way, and there was ample time to discuss the chances of getting through to Kamloops. I was aware that by descending the Columbia to Boat Encampment and thence continuing by the river to Eagle pass, we could avoid the Selkirks wholly, but my present object was to learn all I could from Major Rogers. He had for two seasons been engaged on the discovery of what might prove a considerably shorter passage for the railway across the Selkirk range, and was confident that he would succeed. He proposed to accompany us part of the distance, and to send his nephew, Mr. Albert Rogers, with us as far as we might desire. We camped at the mouth of Beaver river, some thirty miles from our starting point. Next day we followed the rough and recently made trail by the Beaver river itself, a large stream passing through an open canyon for four or five miles. It is quite unnavigable. There are few places where it can be forded. We proceed through a flat, well-timbered valley half a mile in width. There is a dense growth of cedar, spruce and cottonwood; and such magnificent cedar! Four feet and more in diameter. We have now an undergrowth which is the genuine flora of the Pacific slope.

As we advance, dense smoke surrounds us, for we are reaching a region where fires have been burning ahead. With difficulty we continue our advance, hour after hour, in the hope of finding a spot where the horses can pasture, but none is to be seen. There is no alternative but to camp in the midst of the burnt timber. Our poor horses could only nibble the leaves of the devil's club in the attempt to satisfy hunger.

In the morning we continue our journey, passing through a tall forest until we reach a rugged mountain defile leading up to the summit which we are to cross. The mountain peaks rise high above us. Five miles from our last night's camp we leave Bear creek, a branch of Beaver river, and follow a small stream to the south. Half a mile further brings us to the summit. We are now 4300 feet above the sea, surrounded by mountains of all forms, pyramidal, conical and serrated. They are marked in bold relief on the lofty sky line.

As we rest at the summit, Major Rogers describes to us the history of the discovery of the pass. Eighteen years before, Mr. Walter Moberly had ascended the Illecillewaet river on an exploration for the government of British Columbia. He was the first white man to traverse its banks. He ascended the Illecillewaet to the forks, and followed the more northerly branch some thirty miles farther, until it terminated in a *cul-de-sac* among snowy mountains. The other branch he was unable to follow, as the season was then advanced, and his Indian guide declined to accompany him. In his report he spoke hopefully of a route by that branch, and recommended that it should be examined before a road was finally determined on. It was upon this hint that Major Rogers acted. Three years back he traced the Illecillewaet to the forks, and then followed the eastern branch. This branch also proceeded from two streams, the most southerly of which

he followed. With his nephew he climbed a mountain on its northern bank, and from the summit he looked down on the meadow on which we were now resting.

A party had been detailed to cut out a trail westward, which we are to follow as far as it is made passable. Beyond that point our party will be the first to pass across the Selkirk range from its eastern base on the upper Columbia to the second crossing of that river. The horses are still feeding and we have some time at our command. As we view the landscape we feel as if some memorial should be preserved of our visit here, and we organize a Canadian Alpine Club. The writer, as a grandfather, is appointed interim president, Dr. Grant secretary, and my son, S. H. Fleming, treasurer. A meeting is held, and we turn to one of the springs rippling down to the Illecillewaet and drink success to the organization. Unanimously we carry resolutions of acknowledgment to Major Rogers, the discoverer of the pass, and to his nephew for assisting him.

The summit on which we stand is a dry meadow about a mile in extent, with excellent grass. Our horses being satisfied, some are actually rolling in the grass, the hour has come to leave the pleasant meadow in the Rogers pass and pursue our journey. The animals are loaded with their packs. At last we are fairly under way. Our descent is rapid. We soon come in sight of a conical peak rising about fifteen hundred feet, above the surrounding lofty mountains. It stands out majestically among its fellows, and we thought it was a fitting subject for the virgin attempt of the Alpine Club. It now bears the name of Mt. Sir Donald, and Major Rogers declared it would be the summit of his ambition to plant on its highest point the Union Jack on the day that the first through train passed along the gorge we were travelling.

We descend slowly enough, but with increased

rapidity of actual descent, crossing a series of avalanche slides with a growth of tall alder bushes, the roots interlaced in all directions. We soon find ourselves five hundred feet below the summit. Our course had been westerly through a valley flanked on both sides by high mountains. We have difficulty in finding a place to pitch our tent, but finally secure a nook with area enough on the low gravelly bank of a brook of crystal, eighteen inches wide, but so small is the space available that the camp fire must be placed on the opposite side of the rivulet; the murmur of its waters at my feet was the sound by which I fell asleep.

The following morning, we continue through the valley walled in by mountains, the height of which must be counted by thousands of feet. We trudge slowly along the newly cut trail high up among the rocks, to descend again to the flats with its alders and devil's club, until at last we reach a surveyors' camp, twenty-four miles from the summit. Our horses have now to leave us, it being impossible for them to proceed further. The men must carry on their shoulders what we require, through an untrodden forest without path or trail of any kind. We are turning our backs on civilized life and its auxiliaries, again to meet them, we trust, at Kamloops, still many miles away.

We knew nothing of the country before us and had no assistance to look for from the world behind. We were following a tributary of the Columbia to the waters of that river, and this was the one guide for our direction. The walking was dreadful, climbing over and creeping under fallen trees of great size; wading through tall ferns reaching to the shoulder, and millions of devil's club viciously stabbing as we passed. We camp for the night on a high bank overlooking the Illecillewaet. Three days' march carry us scarcely more than ten miles. Rain falls incessantly. We reach the lower canyon of the Illecillewaet, and

climb from rock to rock, grasping roots and branches, scrambling up almost perpendicular ascents, swinging ourselves occasionally like experienced acrobats and feeling like the clown in the pantomime. At some places the loads have to be unpacked and the men draw each other up by clinched hands from one ledge to another. We pass cautiously along a steep slope where a false step is certain disaster; creep under a cascade over a point of precipitous rock to comparatively safe ground beyond. So the story goes from day to day. Finally, after many vicissitudes, we reach the junction of the Illecillewaet and the Columbia, and the worst part of our journey to Kamloops is over.

The First Through Train—1885.

These memories which I have recalled and briefly dwelt upon in the foregoing pages seem to culminate in an occurrence which may be regarded as an epoch in Canadian mountaineering. I allude to the passage of the first railway train through the solitudes of the mountains, along the precise route wearily travelled step by step less than three years before, up the Bow river, through the Kicking-Horse valley, and over the Selkirks by Rogers pass.

The railway had been opened for traffic between Montreal and Winnipeg for some time, when, on the evening of October 27th, 1885, the regular Winnipeg train leaving Montreal had attached to it a private car containing three directors of the Canadian Pacific railway, Lord Strathcona, Sir William C. Van Horne, and the late Mr. George H. Harris. A fourth director (the writer) joined at Ottawa. A delay of two days took place at Winnipeg. Finally the party left on November 2nd, for the far west. Beyond Winnipeg the train became "special." It was the first Transcontinental train crossing Canadian soil. It reached the western crossing of the Columbia in fifty-six hours

after leaving Winnipeg. The railway track some miles ahead was not yet completed, and we could not at once proceed. There was still a gap between the rails laid from the east and those from the west. The delay gave time for reflection, and it was not felt to be tedious among the surprising wealth of mountain scenery on every side. For myself I could not help contrasting the luxurious travelling which the railway afforded with the experience of my little party journeying westward through the mountains in 1883. The special train remained for part of a day and night at a place which has received the name of Revelstoke—almost the identical spot where a couple of years before we found ourselves in a seriously embarrassing situation from the near prospect of starvation. At other times on the journey I usually took my stand on the rear platform watching as we passed the changing scenery and trying to recognize the ground laboriously passed over on the former journey.

Early on the morning of November 7th the hundreds of busy workmen gradually brought the two tracks nearer and nearer, and at 9 o'clock the last rail was laid in its place to complete the railway connection from Ocean to Ocean. All that remained to finish the work was to drive home the last spike. This duty devolved on one of the four directors present—the senior in years and influence, he who is now known the world over as Lord Strathcona. No one could on such an occasion more worthily represent the Company by taking hold of the spike hammer and giving the finishing blows.

It was indeed no ordinary occasion. The scene was in every respect noteworthy, from the groups which composed it and the circumstances which had brought together so many human beings in this spot in the heart of the mountains, until recently an untracked solitude. The engineers, the workmen, every one

DRIVING THE LAST SPIKE AT CRAIGELLACHIE

present appeared deeply impressd by what was taking place. It was felt by all to be the moment of triumph. The central figure—the only one at the moment in action—was more than the representative of the railway company. His presence recalled memories of the Mackenzies, Frasers, Finlaysons, Thompsons, McLeods, MacGillivrays, Stuarts, McTavishs, and McLoughlins who in a past generation had penetrated the surrounding mountains. Today he is the chief representative of a vast trading organization in the third century of its existence.

The spike driven home, the silence for a moment or two remained unbroken. It seemed as if the act now performed had worked a spell on all present. Each was absorbed in his own thoughts. The silence was, however, of short duration. The pent-up feelings found vent in a spontaneous cheer, the echoes of which will long be remembered in association with Craig-gellachie.

In a few minutes the train was again in motion. It passed over the newly-laid rail amid further cheering, and sped on its way, arriving the following morning at Port Moody, where a connection was made with the Pacific on November 8th, 1885. At that date the city of Vancouver was an unbroken forest.

The passage of the first railway train from Ocean to Ocean must, I think, be recognized as an important epoch in Canadian mountaineering. Before the existence of the railway the Rockies could only be approached by toilsome journeys occupying months or more than months. Now all is changed, and our mountain region, a rich heritage, is made accessible to the world, and many persons may now enjoy the privilege of participating in the healthful and noble sport of the Alpine Club of Canada.

EDITORIAL NOTE

Such a noteworthy event as the attainment of his eightieth birthday by the founder of the first Alpine Club of Canada, at the summit of Rogers pass in 1883, and the Patron and Honorary President of the Alpine organization formed last year at Winnipeg, cannot fail to be of the very deepest interest to all our members, and, owing to his many scientific and commercial achievements, to the British Empire.

Thanks to the four sons of Sir Sandford Fleming, we have secured the privilege of presenting to the public with this volume a reduced facsimile of a birthday address presented to their father by his descendants on the day when he reached the mature age of eighty years, January 7th, 1907. The original is a beautifully illuminated sheet, about double the size of the appended copy, which is merely in outline. It furnishes a terse but eloquent autobiography.

We are indebted, in part, to these gentlemen for the explanation which follows. Two of them accompanied their father across the mountains, Major Frank Fleming in 1872, and Sandford Hall Fleming in 1883. The first by the Yellow Head pass, the second by the Bow river and Rogers passes.

They mention that their father at first hesitated to give his assent to the publication of the address, for the reason that however interesting it might be to him and to his children, and however much he and they might appreciate the proposal to incorporate it in the Canadian Alpine Journal, it was after all "merely a family matter, a record of service on the one hand and of loving family devotion on the other, in itself of

To Sir Sandford Fleming C.E. K.C.M.G. LL.D.

On his Eighty-First Birthday January 7th 1907

TIME AND NOTATION

It is with joy and thankfulness that we congratulate you on reaching the age of four score years

While your name has been associated during your long life with many important enterprises [illegible] and an inceptive to lofty and patriotic effort, to your children it has been expressive as well of truth and purity justice and helpfulness, and fatherly love and care

Your public services have been acknowledged by the Sovereign and by Parliament, we offer you this token of love which your noble example and unblemished character have inspired and we pray that in His providence you may long be spared to us in health

Frank H. Fleming	Edith G. Fleming	Bessie F. Fleming
[illegible]	Grace Fleming	Gordon Fleming
[illegible]	[illegible]	Edith Fleming
Florence Fleming	Rev. Howard Fleming	Archie Fleming
Florence S. Bell-Irving	Ethel Jean Chapman	Basil Fleming
[illegible]	Gertrude E. Chapman	Edward Fleming
Lily Eraser	F. W. S. Fleming	Basil G. Fleming
Wm. Eraser	Neil Eraser	John Fleming

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little or no public interest." The request having been pressed by the Editorial Committee, Sir Sandford said: "On public grounds I can see one reason only for waiving my objection. In the centre of the address there is a diagram intended to illustrate the world-encircling Imperial Cable project, respecting which the public mind still needs educating, and no doubt publication of the address with the forthcoming Journal and a reference to this feature of it in the text, would have an educative tendency, productive of good."

It is difficult at a glance to grasp the full significance of the proposal to establish an unbroken chain of state-owned cable-telegraphs connecting all the self-governing British communities in both hemispheres, but by those who have studied the matter, it is regarded to be of immense Imperial importance. At the three Colonial Conferences assembled in 1887, 1894 and 1902 the subject was under consideration. At the two first mentioned, Sir Sandford, representing Canada, as one of the delegates, took a prominent part in the discussions, and his matured views were placed before the Conference assembling in London on April 15th, 1907. For twenty years he has had the keenest desire to promote the project and has never spared himself or lost an opportunity of advancing it. The Empire Cable scheme is one of his highest ideals. He believes most thoroughly that, when eventually consummated, it will, by bringing all the autonomous units of the Empire around the globe into one friendly neighborhood, electrically and telegraphically, become the indirect means of quickening trade, making more effective the ties of sympathy, more enduring the bonds of sentiment, and thus add strength and stability to the great sisterhood of British nations — the development of the new century we have entered on.

THE CANADIAN ROCKIES, A FIELD FOR AN ALPINE CLUB

By Arthur O. Wheeler

The first question is: What constitutes a field for an Alpine Club? The second question, and one of primary importance, is: Do the Rocky mountains of Canada fill the required conditions?

With reference to the former, it is necessary to trace the origin of the word "Alpine." We have the Latin word *alpes,* meaning *a high mountain,* and said to be of Celtic origin. The Irish *ailp* and its Gaelic equivalent *alp* have the same meaning as the Latin. The word *alp* is identical with the word *alb,* which would seem to be synonymous with the word *albus,* meaning *white.* We have, therefore, by a process of deduction, a meaning for the word *alps,* of *high white mountains,* or mountains clad with snow, holding stored in their recesses more or less extensive bodies of the same material.

An Alpine Club is one that has for its field of operations a tract of country fulfilling the above conditions. And herein lies the difference between an Alpine and a Mountain club: while any mountain tract will supply the requirements of the latter, those of the former can only be satisfied by a region where there is a permanent snow line, above which snow and ice may be found throughout the year.

Do the Rocky mountains of Canada fulfil the required conditions? To ascertain this fact, it is only

Photo, Byron Harmon

A PARTY OF GRADUATES AND GUIDES RETURNED FROM THE OFFICIAL CLIMB OF MT. VICE-PRESIDENT

necessary to apply to the Department of the Interior at Ottawa for a topographical map of the Rocky or Selkirk mountain ranges, or to look up the maps and text in "Baedeker's Guide to Canada."

Better still, pay a visit to the region. It will not be necessary to leave the train to obtain a view of vast snow-fields and glaciers. If you can spend a few days by the way, a trip to some of the alpine, glacier-hung valleys will soon convince you; for, in these deep recesses, high above timber line, tumbling ice-falls break in every direction through openings in the rock-battlements and sweep in broken cascades of crystal ice to the morainal flats below. Following the path of the mountain goat from crag to crag, until sky-line is reached, the eye wanders over fields of purest white, rolling gently in billowy mounds, broken only by islands and reefs of jagged rock. Many of these snow-fields are of considerable extent, varying from ten square miles in the Illecillewaet, twenty in the Wapta, and thirty in the Brazeau, to between one hundred and two hundred square miles in the Great Columbian snow-field.

In a new and as yet inadequately mapped country, such as Canada, it is impossible to do more than approximate the area that may be described as "alpine." Roughly speaking, it can be placed at 250,000 square miles. This area is embodied by the Cordilleran or Rocky Mountain chain, embracing four principal ranges of mountains and numerous sub-ranges and groups. Enumerating from east to west, we have the Rocky Mountain or Main range, the Selkirk range, the so-called Gold range, and finally the Coast range, lying along the Pacific ocean.

Each of these ranges has its own distinct characteristics. In the Main range, the rocks, generally speaking, belong to the Paleozoic period, and consist for the most part of grey and blue limestones, sand-

stones, quartzites, slates, shales and conglomerates. They have been carved, by the processes of erosion and weathering, into many and varied styles of architecture, rising in such a profusion of fantastic towers, minarets, spires and obelisks as to delight the eye of the most exacting seeker after the picturesque. In these limestone rocks, of the Silurian and Devonian series, are seen fossil sea-worms and shells, and other relics of the low order of life in a by-gone age. They are found even at the very summits of some of the peaks, at an altitude of 10,000 feet above the level of the sea—their former home. At the other places, beds containing fossilized species, closely allied to the trilobite, are to be found. One of these, on the slopes of Mt. Stephen, at an altitude of 7000 feet, has become famous.

In this range, the valleys are wide, owing to the susceptibility of the rock formations to the erosive power of ice and water. Their sides, clad with bronze-green pine and dark blue spruce, sweep upward to open parklands, dotted with golden larch; then, to sunny alplands, where the ground is soft with a carpet of pink heath and white heather and where other alpine flowers of rare beauty and brilliance grow. Hidden in the recesses of these forests and high aloft, surrounded by snow, ice and rock-falls, are lakes of magic hues, like quaint jewels in rare old settings; turquoise green, in Hector, Bow and Emerald lakes; turquoise blue in Peyto lake; transparent emerald in Yoho lake; bright cerulean blue in McArthur and Turquoise lakes; royal blue in Lake Louise; even brilliant yellow may occasionally be seen. It is a land of leaping waterfalls and rushing torrents, of fierce sunlight and black shadow, of rosy alpen-glow and purple twilight, a land of enchantment, where extremes meet; for it is but a step from grim, gaunt and cruel rocks to sunny alps, brilliant with the bloom of rare, exquisite flowers, and

teeming with animal life, quaint and uncommon as the surroundings.

The Selkirk range lies west of the Main range. It is practically a vast island of rock, ice and snow, insulated by giant loops of the Columbia and Kootenay rivers. The material composing it is of a much older and harder formation, consisting chiefly of archæan rocks: grey, pink, green and white quartzites, glittering mica-schists, argillites and rocks of gneissic character. The valleys are narrow, and the mountain masses rise swiftly up, their sides scored and seamed by giant scaurs. The fantastically carved limestone shapes of the Main range are lacking.

The two most striking features of the range are its impenetrably luxuriant forests, filling up the valleys, and the immense accumulations of snow and ice stored in its mountain recesses, high up among the clouds. The former contribute much to the seeker after the picturesque in Nature, and the latter are a source of joy to the true alpine enthusiast. Both effects are from the same cause, viz.: the large amount of precipitation deposited in the form of snow, accumulating from year's end to year's end until the entire cap of the range appears in perspective as an endless succession of snowfields, with precipitous black faces of rock rising at intervals from their midst, where the sheer is too steep for snow to lie. Nor is this to be wondered at when it is considered that the average snowfall at the summit of the range is thirty-six feet, with an additional rainfall of thirteen inches; making in all an annual precipitation of fifty-seven inches of water. In comparison may be mentioned the annual average snowfall of about fifteen feet, and annual precipitation of about thirty inches, at the summit of the Main range.

The excessive precipitation in the Selkirks is due to the fact that it is the first high range of mountains to intercept the moisture-laden clouds borne eastward

from the Pacific ocean by prevailing winds. The decreasing pressure, as this current is deflected upward over the range, causes a rapid cooling of the air and a consequent deposit of the large bodies of snow found in these mountain fastnesses.

Where, in the Main range, the slopes are clad with pine, spruce and larch, according to altitude, in the Selkirk range, Douglas fir, hemlocks, cedar, giant spruce and balsam take their place. These forests of green, so deep in color as to appear almost black, rise grandly to the snows, and often amidst the trees may be seen crystal cascades of ice, tumbling in a wild confusion of *séracs* down rocky beds.

The Selkirk range is remarkable for the number, purity and picturesque formation of its glaciers. In size they may not compare with the ice-rivers of other ranges, but what they lack in size, they more than make up in their wonderfully crevassed surfaces and in the grotesque *séracs* that are formed where they break over cliffs and rock ledges. Specially beautiful are the hanging and confluent glaciers, high up on the mountain sides, dropping tons of crystal ice daily to the trunk streams below. Splendid examples of these may be seen above the Battle glaciers at the head of Battle creek, and in the hanging valley of Cougar creek; also, in the Main range the narrow gorge, known as "The Death Trap," leading between Mts. Victoria and Lefroy to Abbott pass. During the warm summer days the roar of ice falling from these upper glaciers is incessant.

The Gold range, situated westward beyond the Columbia river on its southern course, resembles the Selkirk range, but here the great ice-plough of a by-gone age has done more serious work, and the sharp peaks and jagged edges of the Selkirks give place, as a rule, to rounded domes and elevated plateaus, covered most of the year by snow. The rock formation is

more purely achæan and consists chiefly of grey gneisses, varying from massive to schistose, and highly micaceous.

The Coast range, reaching into the far northland, is cut and intersected by many inlets from the sea. These inlets are often narrow and enclosed by precipitous sides of rock, over which cascades fall hundreds of feet to tide-water below. The steeps are clad with forests of tropical luxuriance, through which it is only with great difficulty a passage can be forced, and giant trees of fir, cedar and balsam grow nearly to the summits of the mountains. As you proceed northward, the timber-covering becomes more scant until, at length, it is found only at the bottom of the lower valleys.

There can be little doubt that the characteristics outlined above, furnish not only a worthy field for an alpine organization, but a field of immense magnitude, and one that will continually offer something new for many years to come. It is true we have not the great height of other mountain systems of the world. Mt. Blanc, the giant of the European Alps, is 15,780 feet above the sea; Mt. Tacoma, in Washington, is 14,526 feet; Popocatapetl and Orizaba, in Mexico, are 17,500 and 18,300 feet; Mt. McKinley, in Alaska, is said, by a recent explorer, to be 20,300 feet, and the Himalayas reach the enormous altitude of 29,000 feet. Against all this, except in a few isolated cases—Mt. Logan, 19,500; Mt. Hubbard, 16,400; Mt. Vancouver, 15,600; Mt. Augusta, 14,900, and others in the Yukon Territory, with Mt. Robson, 13,700, and Mt. Columbia, 12,700, in British Columbia,—we can only boast a general altitude of 10,000 to 12,000 feet; but, for primeval forests, beauty of glaciers and labyrinthine organization, the Rockies of Canada cannot be surpassed.

Up to the completion of the Canadian Pacific railway in 1885, there was no thought of mountaineering

in Canada. Prior to that date, by one year, attention was first called to the claims of the Canadian Rockies as a field for alpine work, and the great attractions they offered to mountaineers, by the Honorary President and Patron of our Club, Sir Sandford Fleming, K.C.M.G., who had the year before made a journey on foot through this rock-bound wilderness, along the route it was proposed to lay the rails. In his book, "England and Canada, a Summer Tour between Old and New Westminster," he frequently refers to the massive, snow-clad peaks and crystal ice-falls of the Rocky mountains as affording a suitable field for mountaineers.

In 1888 the Royal Geographical Society, represented by the Rev. William Spotswood Green* and the Rev. Henry Swanzy, made explorations and rough topographical surveys in the vicinity of Glacier, near the summit of the Selkirk range. They then made the first ascent of Mt. Bonney (10,200 feet), at that time an arduous two-day climb from Glacier station. As a result, Mr. Green's able and instructive book, "Among the Selkirk Glaciers," appeared in 1890, giving a delightful and humorous description of the range and of his climbs and surveys.

It was in 1890 that the region was visited by representatives of the English and Swiss Alpine Clubs: H. W. Topham of the former, and Emil Huber and Carl Sulzer of the latter. Both parties realized that, at that early date, the most accessible alpine material lay in the Selkirks; so they made their headquarters at Glacier and, joining forces, accomplished many splendid climbs together.

This year also, Professor Charles E. Fay* of the Appalachian Mountain Club of Boston, visited the Selkirks and was so impressed with what he saw that he not only repeated his visit but brought many others

* Honorary Member of the Alpine Clul of Canada.

MOUNT WAPTA FROM YOHO CAMP

with him, the result being: first, the formation of an Alpine section of the Appalachian Club, and eventually the organization of the American Alpine Club, of which Professor Fay is now President. From 1890 on, "Appalachia," the organ of that Club, set forth the conquests made by its members in the Canadian mountains, and furnishes much instructive and interesting reading.

An account and map of the expeditions of Professor A. P. Coleman** and Professor L. B. Stewart of Toronto University, accompanied by L. Q. Coleman,** to the headwaters of the Athabaska river, by new and unmapped routes, will be found in "The Geographical Journal" of January, 1895. These trips, made in 1892 and 1893, resulted in the discovery of Fortress lake, lying directly upon the Continental watershed, and in the dethroning of Mt. Brown, on the west side of the Athabaska pass. The mountain was climbed by Professor Stewart and L. Q. Coleman and the altitude fixed, by barometric readings, at 9050 feet instead of over 16,000 feet, as it is, even at the present date, shown in standard geographies and on published maps. At this time, eight peaks over 9000 feet above sea level were climbed, and three over 10,000 feet. A later expedition in 1903 resulted in the mapping of the Brazeau snow-field, never before visited by white men.

In 1894, W. D. Wilcox, S. H. S. Allen and two other young college men visited Lake Louise, of which the striking beauty had already been realized to such an extent that the Railway Company had built a small chalet on its borders to accommodate a few visitors. On this occasion, they discovered Paradise valley, where the Club will camp during the present summer. The explorations then made and, the following year, to the headwaters of the Bow river, resulted in Mr. Wilcox's artistic and beautifully illustrated book,

** Active Member of the Alpine Club of Canada.

"Camping in the Canadian Rockies,' which has since been amplified and brought up to date as the author pushed his investigations farther afield, both north and south, accompanied in the latter direction by Henry G. Bryant of the Philadelphia Geographical Society.

The late Jean Habel of Berlin, a noted explorer and enthusiastic mountaineer, explored the Yoho valley in 1897, and it was due to his representations that it first attained notoriety. Again, in 1901, he travelled to the headwaters of the Athabaska river, visited Fortress lake, and gazed upon the mighty Mt. Columbia, which he designated in his records as "Gamma."

Subsequently, we have records of explorations and first climbs, in 1897, 1898, 1900 and 1902, by Dr. J. Norman Collie,* Hugh E. M. Stutfield, G. P. Baker and Hermann Woolley in the mountaineer's paradise on the north side of the Blaeberry river, along whose banks lay the old Howse pass route of early fur-trading days. These have been embodied in a splendid book: "Climbs and Explorations in the Canadian Rockies," written jointly by Mr. Stutfield and Dr. Collie. Accompanying the book is the only existing detail map of the region.

In 1901, and following years, came Mr. Edward Whymper* with four Swiss guides. The same year, the Rev. James Outram captured Mt. Assiniboine, and, in 1902, he made his big killing in the north country, first explored by Collie, Stutfield, Woolley, and Baker. Mts. Columbia, Bryce, Lyall, Alexandra and many others succumbed to his attacks, a truly wonderful mountaineering record for one summer. Mr. Outram has set forth his achievements in a well-written and charmingly descriptive book, entitled, "In the Heart of the Canadian Rockies."

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* Honorary Member of the Alpine Club of Canada.

Each year two or three travellers penetrate into the wilderness of snow-clad peaks and rushing glacier-torrents, described in the works named, and some publish accounts of their impressions, but they follow only the beaten paths of the pioneers and see the sights they have seen.

Minor explorations have been made of valleys and passes opening from the main routes along the Bow and Saskatchewan headwaters by members of the Appalachian Mountain Club, among whom may be named: C. S. Thompson, G. M. Weed, Rev. H. P. Nichols, C. L. Noyes, and H. C. Parker;* also, at the sources of the Beaverfoot river by J. H. Scattergood. Accounts of these investigations will be found in the various numbers of Appalachia appearing since 1890. There are but two deviations from the beaten line of travel that have given us mapped results: Collie and Stutfield's exploration of the Bush river and vicinity, on the western side of the Main range, and Wilcox and Bryant's expedition to the headwaters of the Kananaskis river.

Notwithstanding the large amount of information contained in the books referred to, our absolute knowledge of Alpine Canada is confined to a strip of little more than ten miles on either side of the Canadian Pacific railway, possibly some five or six thousand square miles, and what may be seen by travelling the paths cut by Collie, Stutfield, Baker, Wilcox and a few others. The books published all cover, practically, the same ground, with the exception of the trips up the Bush river and to the Kananaskis headwaters. The region lying between the Columbia river on the west, the Blaeberry on the south, and the Saskatchewan on the east, is unknown territory except to the pioneers who have published its fame The only map we have of it is the one accompanying Dr. Collie's book, and

* Life member of the Alpine Club of Canada.

that is admittedly a "sketch map." This field alone, embracing from 20,000 to 25,000 square miles, the finest alpine country of the entire Continent, is sufficient to supply an alpine club with work, both scientific and athletic, for many years to come. In the Selkirks, north of Mt. Rogers and south of Mt. Purity, lie unknown tracts, with peaks, towers, pyramids and pinnacles, rising from wide snow-fields, that are unknown, unnamed, and unmapped, and have only been seen from Selkirk summits near the railway and from the more distant Rockies.

The Dominion Government is steadily pushing its topographical surveys into the unknown terrtiory, but these surveys are slow and costly and some adequate return must be in sight before they can be undertaken.

The books, etc., published by the authors named have attracted a great many people to the region, and, to meet the demand, the Canadian Pacific Railway Company have erected a number of hotels at beauty-spots along the line, which have been enlarged and modernized, until now the acme of luxury may be found in the heart of these wilds, where the many forces of Nature that contribute so largely to a civilized world are seen at work.

A list of the publishers of the accounts of the expeditions named above will be sent on application to the writer. It is strongly recommended that each members of the Club study these writings and thus obtain such elementary knowledge of our alpine tracts as at present exists, with a view to increasing that knowledge by making more extended explorations into the partly known districts, and organizing methods for reaching the parts that are quite unknown.

ICE CAVES ON THE VICE-PRESIDENT GLACIER

THE ALPINE CLUB'S WAR CORRESPONDENT

CANADA'S FIRST ALPINE CLUB CAMP

By Frank Yeigh

The wayfaring globe-trotter who chanced to reach Field station, on the Canadian Pacific railway, on the evening of July 8th, 1906, must have wondered at the scene of excitement and activity revealed in that spacious hostelry. For undoubtedly excited the groups of fellow-travellers were, and with rare good cause, for were we not the lucky folk privileged to be present at the christening of the Alpine Club of Canada, on the occasion of its first annual camp in the Rocky mountains. Tenderfeet and old-timers alike were equally seized with a delicious fever of expectation. From England, from the United States, and from many corners of Canada the alpinists-in-embryo had thus foregathered at this appointed rendezvous under the shadow of Mt. Stephen, the grim old King of the Rockies. Some were armed with ice-axes and alpenstocks—and umbrellas, and all were laden with impedimenta, the wonderful contents of which were not revealed till the next morning, when the actual start was made by the actual members of an actually formed Alpine Club for Canada!

No wonder we were excited! For once in our blessed lives we all saw the sun rise and flood the awesome canyon of the Kicking Horse as the dark shadows of the night were dispelled. Soon after sunup the thin long line of amateurs, with Excelsior written on face and in eye, crossed the bridge over the Kicking-Horse and took to the road that leads through a silent forest aisle to Emerald lake. That seven-mile path through the trees, with a snow-

enshrined peak closing the view at either end, stirred every heart and led to an exaltation of spirit and buoyancy of life that never left us. Most of the campers were first trampers over this bit of road, a few following in the comfortable carriages or perched aloft on the commisariat wagons. Striking to a degree were the costumes worn by the mountain invaders, and while not so stylish as an Easter day parade at Atlantic City, there was more variety; yes, one may safely assert, infinitely more variety.

So we were really off at last! The months of anticipation had ended, the days of realizing delight had come as we trudged off the first few miles. Why an Alpine camp? may be asked. A clause of the Constitution reads, and when a Constitution speaks let all listen: "A summer camp in some suitable part of the mountain regions shall be organized in each year for the purpose of ennabling graduating members to qualify for active membership, and the members generally to meet together for study in the alpine districts of Canada."

It was no small task to plan such a camp, to be placed on a summit 6000 feet above the sea, and at a distance of nearly a score of miles from the nearest railway station. It was an even greater task to provide at such an inaccessible spot for a hundred people and to carry thereto on pack ponies the thirty or forty tents, with necessary equipment and provisions. The Club, moreover, was at the time only four months old, having been organized in Winnipeg in the previous March. Never before had a camp on such a large scale been attempted, especially by such a youthful organization. The project was, therefore, a somewhat daring one and was made possible of successful achievement by a strong union of forces on the part of governments, railway companies and individuals. This unity of action was brought into play

Photo, Rev. G. R. Kinney

MOUNT BURGESS AND EMERALD LAKE

not as a mere whim or from any selfish motive, but in a spirit of patriotism worthy of all praise and emulation. The Dominion Government contributed assistance to the value of $500, the Alberta Government contributed $250, private subscriptions amounted to $170, and four of the principal mountain guides and outfitters gave their services and the services of their men, horses and outfits free of charge, to make the first camp a success. These men are: R. E. Campbell of Laggan and Field, Martin and Otto (now Otto Bros.) of Field, Leanchoil and Golden, E. C. Barnes of Banff, and S. H. Baker of Glacier. All honor is due them, for they cannot well afford to curtail the profits of their short seasons. The Canadian Pacific Railway Company was no whit behind. It loaned the Club two Swiss guides for the week of the Camp, loaned tents, canopies and other outfit, and placed its cooks in the Company's Yoho camps at the disposal of the Club. Tents also were loaned by the Royal North-West Mounted Police at Calgary and Banff, and bunting by the Superintendent of the Rocky Mountains Parks. Taken all round, the greatest interest and enthusiasm was shown, not only in the formation of the Club itself, but in the organization of its first camp.

Let us return to the straggling procession of Alpinists as they round up at the Emerald Lake Chalet. The world yet awaits the heaven-gifted artist of brush or pen who will transmit to canvas or paper the transcendent beauty of this mountain lake nestling so peacefully at the base of mighty Mt. Burgess—

> "a lofty precipice in front,
> A silent tarn below."

It was at Emerald lake that the real part of the first day's work began, involving the traverse of the broad glacial delta on its northern shore and the ascent of the steep cliff wall that appeared to bar all further

progress, and yet that had to be negotiated if the Camp was to be reached before nightfall. It was a case of fun and work combined, and fun and work make a fine team when well mated. The ceremony of initiation into mountain work was here observed. First came the passage of an endless number of streams flowing from the Emerald glacier, thousands of feet higher. Pioneering the first section of the party was the Rev. Dr. Herdman, of Calgary, who proved himself to be a born mountaineer. Those who followed him as a vanguard had many lively experiences in negotiating the mad little rivers, for the log bridges had been swept away as the waters rapidly rose under the influence of the summer sun upon the glacier. Soon all traces of earlier trails were lost as search was made for suitable fords, until at last the pack ponies were requisitioned as bridges to carry the pilgrims over safely.

After the delta, the deluge, as a storm broke over us, giving the invaders of the hills their first, but not their last, nature bath. After the delta and the deluge, the initial bit of stiff up-grade climbing, of nearly a thousand feet, tested strength and breath. The rest cure soon became popular, and while the second wind was whistled for, entrancing glimpses were had of the lake valley, of the enclosing ranks of peaks, and, nearer at hand, of the massive buttresses of Mt. Vice-President, carrying on their granite slopes tumultuous floods of milk-white waters to the lake reservoir of emerald hue. A dense forest of spruce succeeded the stiff climb; wherein, for the time, the wonder-world of summits was obscured, but wherein another wonder-world of Nature unfolded itself in flower and fern and forest growth, of heath and heather, Painter's Brush and Yellow Columbine, of Anemones, Gailardias, and many another botanical specimen, making brilliant the floor of this Forest of Arden.

Photo, Byron Harmon

THE DINING-PAVILION AT YOHO CAMP

At last, the summit of Yoho pass! At last, that striking picture of a tented town nestling amid the realm of trees! You remember it, do you not, fellow-camper? the white canvas homes for a brief day amid avenues of greenery, under a sky of blue, with grey old Wapta and Michael's mount standing sentinel, three thousand feet higher still. You remember, do you not?—as if we could ever forget—the incomparable scene beside the incomparable Yoho lake, holding in its translucent waters all the emerald and amethyst shades in Nature's color box. You recall the welcoming camp fire of huge dimensions, and the yet more welcome aroma of THINGS TO EAT as cooked by that cheerful Celestial, Jim Bong, otherwise known as Ping-Pong. May his fat shade never grow less.

The Camp, made gay with banners and flags and bunting of many colors, was divided into three sections: Residence Park, Official Square, and the horse paddock. The arrangements were perfect to a detail, thanks to the forethought and hard work on the part of the President, Mr. Arthur O. Wheeler, and his efficient staff. The dining tent accommodated one hundred, where meals were served from early morn till late night. A bulletin board kept the members acquainted with the daily programmes. In the centre of the Square the big fire burned unceasingly, brightening up for the evening hours, when it was surrounded by as many fire worshippers as there were occupants of the tents, and where were heard more Demosthenian eloquence and oratory, more jokes and quips and antique chestnuts, and more accomplished entertainers than ever gathered on a mountain summit before. It is a pity the Journal cannot hold within its pages all that was said and sung and done around that cheerful camp fire.

But we were in Camp Yoho for the express purpose

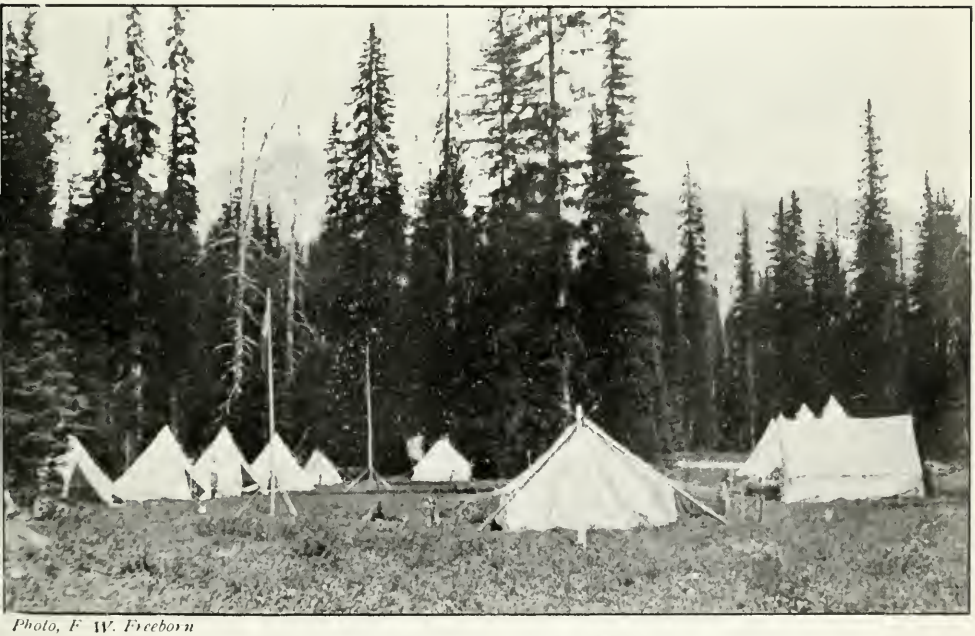
of going farther and climbing higher than even the 6000 feet altitude of the Camp site. Thus there were daily exploring and climbing trips in all directions. The mountain selected for the official climb is known as "The Vice-President," so called by Mr. Edward Whymper, of Matterhorn fame, in honor of the Vice-Presidency of the Canadian Pacific railway. Its altitude is 10,050 feet. The peak was selected on account of the varied phases of mountaineering presented.

The first official climb was made on Tuesday, July 10th, the party leaving the camp at 5.30 a.m. and arriving at the summit of the Vice-President at 11.30 a.m. The return was made in three and a half hours. Two ladies then graduated, viz.: Miss K. McLennan, of Toronto, and Miss E. B. Hobbs, of Revelstoke. Official ascents were made on the four following days, but the one named made the record time, *i.e.,* ascent and return in nine and a half hours. In all forty-four members graduated, of whom fifteen were ladies. Not one graduating member who attempted the climb failed. Do not think, because there were no failures, the climb was an easy one. Not so! It is a peak presenting many difficulties and some danger. The average time of ascent was seven hours and of descent three and a half hours, making altogether an average climb of ten and a half hours—a pretty fair test and initiation for those who were, for the most part, absolute novices. It goes to show that right here in Canada we have the very best of mountaineering material, and it only needs a little fostering care to develop to the fullest extent this latent talent.

There were a number of other mountains climbed, eight in all, not counting Michael's mount, which was taken en route for the Vice-President. The two highest were Mt. Collie and the President, both over 10,000

Photo, F. W. Freeborn

MOUNT VICE-PRESIDENT—THE OFFICIAL CLIMB



Photo, F. W. Freeborn

RESIDENCE PARK—YOHO CAMP

feet. The climb of Mt. Collie was made by J. D. Patterson of Woodstock, under the auspices of the Club. He was accompanied by the Swiss guide, Gottfried Feuz. Curiously enough, the mountain was ascended on the same day by a lady member of the Club, but one who was not visiting at the Camp, by a different route, and the two climbers met on the summit of the peak. The lady was Miss Henrietta L. Tuzo, of Warlingham, England. Of the others, Mt. Wapta seemed to be the favorite, ascents having been made of it by four separate parties, by two different routes. The other mountains ascended were: Mt. Burgess—though one of the lowest, one of the most difficult climbs,—Mt. Field, Mt. Marpole, and the peak lying between it and Mt. McMullen, both as far as known, virgin ascents. The unnamed peak was christened "Amgadamo."

Bordering the palisades of the Vice-President for a mile or more is the Emerald glacier, and to the Emerald glacier the Club campers made their way in detachments. It proved to be not the least delightful of the series of excursions, as for the majority it was their first experience in ice climbing. Again, variety marked every mile of the way. Again, entrancing vistas of distant peaks were unfolded at many a turn in the switchback trail, and with each higher altitude gained, the panorama grew in vastness and magnificence. Nature never duplicates her canvases, especially amid the mountains.

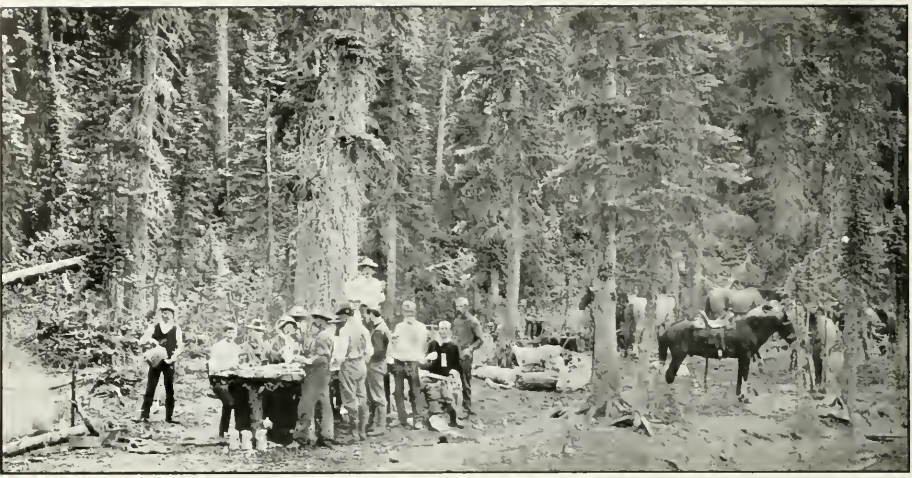
Crossing in part the same route as that covered by the Upper Yoho trail to Inspiration point, with its superb and dramatic picture of the Takakkaw falls on the far side of the valley, a turn to the left was made by the guide in order to reach the foot of the ice-sheet whose gleaming edges hung suspended far above us. A stiff bit of ascent over a boulder-strewn incline gave each one unexpected surprise practise in baseball

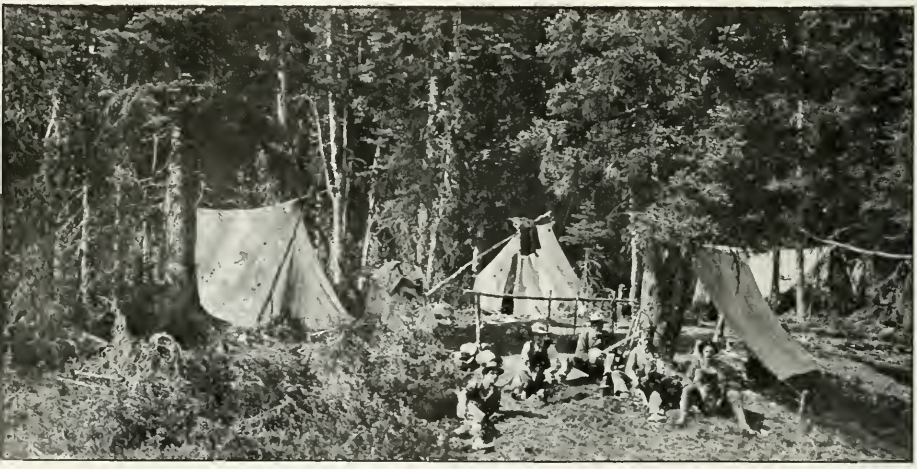
catching, as descending rocks were caught and hurled aside in order to prevent a rock-slide.

Rounding a ticklish corner of rock-wall and crossing a noisy little stream, rejoicing in its escape from the ice caverns, the snow line was reached and a snow-balling match was indulged in to celebrate the summer day event. And while it was under way, what would have been a shower in the valley became a sleet storm up aloft, at the elevation of 8000 feet above the sea, the wind driving the frozen sand-like flakes with stinging effect against our faces. But the sunshine soon returned with its grateful warmth, and with it a revival of spirits and a quickened pace up the ice-steps cut for us by our leader. At last, the main icefield was reached, with its miniature mountains of ice known as *séracs,* its deep chasms and moulins, and its under-surface streams making their way to lower levels. On either side gaping crevasses reached to unknown depths, the wonderful coloring of their green-blue walls fascinating the eye while they terrified the mind at the thought of what a misstep might result in. An occasional halt enabled the alpen-stock travellers once more to revel in a sweeping vision of our giant hills, where

"Hills peep o'er hills, and Alps on Alps arise."

Then there was the two-day trip up the floor of the Yoho valley and back by its upper trail. That experience was worth the whole journey to the scene, no matter from what far-away distance. One stood entranced amid the scenic grandeur: the wonderful coloring, the titanic peaks guarding the vale, and the distant views of other alpine giants. The beholder rejoiced in such a revelation of Nature, he rejoiced in the freedom of the open, in the chance to breathe the pure air of the hills, in the rare opportunity of living among the Kings of the Cordilleran range. We had sped across God's plains to reach the Rockies, now we





OUR BIVOUACS ON THE YOHO TRAIL

were living amid God's hills. In the silent watches of the night, when we camped near the Laughing falls, God's stars seemed to hover nearer than ever before, and on every hand were God's rivers and cascades and forests and glacial streams and icefields capping the summits.

"I to the hills will lift mine eyes." Often rang out the words of the grand old psalm, as hillward and mountainward the eyes of all were instinctively lifted in solemn worship and in admiring praise. A fit temple in which to worship the Creator of this and all worlds was the Yoho.

It was a rare day in summer when we thus meandered over the alluring trail, past the Takakkaw falls —Canada's highest Niagara—past the Laughing falls and the Twin falls, and many another no less beautiful, to the great Yoho glacier at the uppper end of the valley, with its giant caverns, showing strangely blue and green, and from the throats of which the streams had their birth that later made the Yoho river. I would like the space to tell of that night in the Yoho around our camp fire, of the tales told by Jack Otto—honest Jack Otto,—of the bear stories that fell from his lips till the sight or sound of a fat old porcupine made us believe we were face to face with a grizzly! I could fill a book, if it were not too bulky, with all that might be recorded of the Yoho tramp, up and down this Yosemite of Canada, and of the charming upper trail journey homeward, when from lofty platforms of rock we saw the entire fifteen-mile valley lying below us as in a picture, bordered by the Cathedral spires on the south and the Yoho glacier on the north.

In the matter of Science, work was begun by placing a row of metal plates across the ice tongue of the Yoho glacier to mark its rate of flow down its bed. Rocks also were marked to show the advance or retreat of the ice. This year, further observations will be made, and

the several movements ascertained. A full account of the operations carried out will be found in these pages.

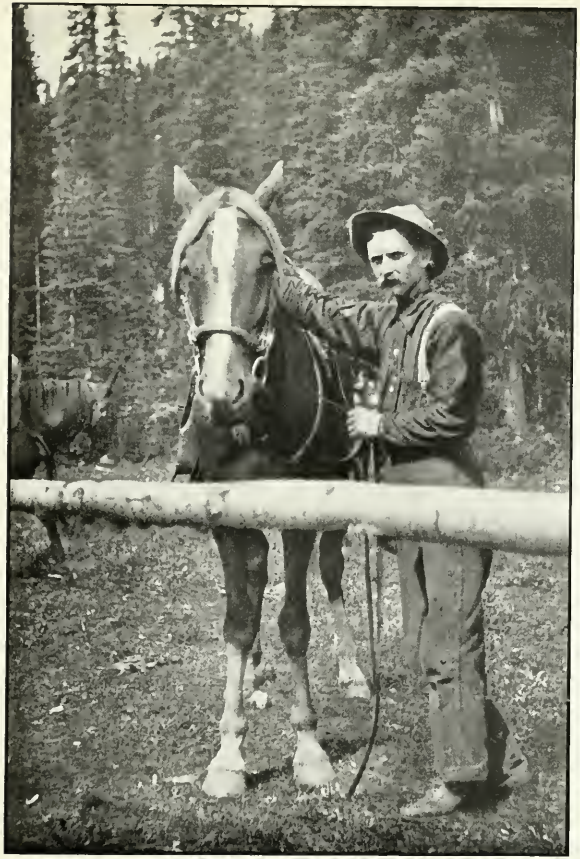
Financially, the camp proved a success, and after all expenses were paid there was a sufficient sum in hand to partially reimburse the outfitters for their gratuitous outlay, and, even then, a small balance was paid in to the funds of the Club. This was made possible by the great enthusiasm that prevailed throughout, leading to a generosity on the part of the visitors that was most pleasing and encouraging, and fully repaid those who had spent much time and labor in making preparation for the event.

The great success of the camp was almost wholly due to the skill, energy and business-like determination of the outfitters—the men in buckskin—who started out to make the camp a success and did so. No whit behind were the ladies present, all of whom gave the heartiest assistance in all matters wherein feminine skill is most required—in helping the cook, decorating and waiting on the tables, and generally making themselves charming around the camp fire. Much wit and artistic talent were displayed to help make the evenings pass pleasantly, and particularly, in this respect, are the thanks of the assembly due to Miss Edna Sutherland of Winnipeg.

The camp broke up on the 16th of July, but two more days were required to pack up and remove the outfit. Some few stayed until the last moment. When returning home, many reached Mt. Stephen House by way of the Burgess pass trail.

In all, the camp was designed for one hundred persons, but one hundred and twelve attended, and the arrangements were such that one hundred and fifty might as easily have been accommodated.

Throughout the entire gathering, there was a harmony, a hail-fellow-well-met feeling, an unexpressed but very apparent resolve by each individual to have



THE MEN IN BUCKSKIN

TWO VETERANS

the time of their lives, that resulted in a most pleasurable and instructive outing, proving clearly that, not only has Canada the material to create a first-class Alpine Club, but has the proper people ready and willing to take advantage of the opportunity offered by such a Club to learn something of and thoroughly enjoy the grand mountain regions that are the heritage of each and every Canadian. One of the richest assets of the Dominion are her mountains, and the Alpine Club of Canada hopes to have a share in enabling the Canadian people to realize upon the asset.

HOW WE CLIMBED CASCADE

By Ralph Connor

Just beyond the Gap lies Banff, the capital of the Canadian National Park, a park unexcelled in all the world for grandeur and diversified beauty of mountain scenery. The main street of Banff runs south to Sulphur mountain, modest, kindly and pine-clad, and north to Cascade, sheer, rocky and bare, its great base thrust into the pine forest, its head into the clouds. Day after day the Cascade gazed in steadfast calm upon the changing scenes of the valley below. The old grey face rudely scarred from its age-long conflict with the elements, looked down in silent challenge upon the pigmy ephemeral dwellers of the village at its feet. There was something overpoweringly majestic in the utter immobility of that ten thousand feet of ancient age-old rock; something almost irritating in its calm challenge to all else than its mighty self.

It was this calm challenge, too calm for contempt, that moved the Professor to utter himself somewhat impatiently one day, flinging the gauntlet, so to speak, into that stony, immovable face: "We'll stand on your head some day, old man." And so we did, and after the following manner.

We were the Professor, by virtue of his being pedagogue to the town, slight, wiry, with delicate taste for humor; the Lady from Montreal, who, slight as she was and dainty, had conquered Mt. Blanc not long before; the Lady from Winnipeg, literary in taste, artistic in temperament, invincible of spirit; the Man from California, strong, solid and steady; the Lady

Photo, Byron Harmon

CASCADE MOUNTAIN, BANFF, ALBERTA

from Banff, wholesome, kindly, cheery, worthy to be the mother of the three most beautiful babes in all the Park and far beyond it; and the Missionary.

It was a Thursday afternoon in early September of '91, golden and glowing in smoky purple hues, a day for the open prairie or for the shadowy woods, according to your choice. Into a democrat we packed our stuff, provisions for a week, so it seemed, a tent with all necessary camp appurtenances, and started up the valley of the little Forty Mile creek that brawled its stony way from the back of the Cascade. We were minded to go by the creek till we should get on to the back of old Cascade, from which we could climb up upon his head. Across the intervening stretch of prairie, then through the open timber in the full golden glory of the September sun, and then into the thicker pines, where we lost the sunlight, we made our way, dodging trees, crashing through thickets, climbing over boulder masses, till at last the Professor, our intrepid driver, declared that it would be safer to take our team no further. And knowing him, we concluded that advance must be absolutely impossible. We decided to make this our camp.

To me a camp anywhere and in any weather is good, so that it be on dry ground and within sight, and better within sound, of water. But this camp of ours possessed all the charms that delight the souls of all true campers. In the midst of trees, tall pines between whose points the stars looked down, within touch of the mountains and within sound of the brawling Forty Mile creek and the moaning pines. By the time the camp was pitched, the pine beds made and supper cooked, darkness had fallen. With appetites sharpened to the danger point, we fell upon the supper and then reclined upon couches of pine, the envy of the immortal gods. With no one to order us to bed, we yarned and sang, indifferent to the passing of the night

or to the tasks of the morrow, while the stars slowly swung over our heads.

At last the camp was still. Down the canyon came the long-drawn howl of a wolf, once and again, and we were asleep; the long day and the soothing night proving too much for the shuddering delight of that long, weird, gruesome sound. We turned over in our sleep and woke. It was morning. The Professor had already "fixed" the horses and was lighting the breakfast fire. Unhappily, we possessed the remnants of conscience which refused to lie down, and though the sun had given as yet no hint of arriving, we persuaded ourselves that it was day. A solid breakfast, prayers, and we stood ready for the climb, greener at our work than the very greenest of the young pines that stood about us, but with fine jaunty courage of the young recruit marching to his first campaign.

An expert mountain-climber, glancing down the line, would have absolutely refused to move from the tent door. With the exception of the Lady from Montreal, who had done Mt. Blanc, not one of us had ever climbed anything more imposing than Little Tunnel, one thousand feet high. While as to equipment, we hadn't any, not even an alpenstock between the lot of us. As for the ladies, they appeared to carry their full quota of flimsy skirts and petticoats, while on their feet they wore their second-best kid boots. It was truly a case of fools rushing in where angels pause. Without trail, without guide, but knowing that the top was up there somewhere, we set out, water-bottles and brandy-flasks—in case of accident—and lunch baskets slung at the belts of the male members of the party, the sole shred of mountaineering outfit being the trunk of a sapling in the hand of each ambitious climber.

As we struck out from camp, the sun was tipping the highest pines far up on the mountain side to the west. Cascade mountain has a sheer face, but a long,

sloping back. It was our purpose to get upon that back with all speed. So, for a mile or more, we followed the main direction of the valley, gradually bearing to our right and thus emerging from the thicker forest into the open. When we considered that we had gone far enough up the valley, we turned sharply to our right and began to climb, finding the slope quite easy and the going fairly good. We had all day before us, and we had no intention of making our excursion anything but an enjoyment. Therefore, any ambition to force the pace on the part of any member was sternly frowned down.

By 10 o'clock we had got clear of the trees and had begun to see more clearly our direction. But more, we began to realize somewhat more clearly the magnitude of our enterprise. The back of this old Cascade proved to be longer than that bestowed upon most things that have backs, and the lack of equipment was beginning to tell. The ladies of our party were already a grotesquely solemn warning that petticoats and flimsy skirts are not for mountain climbers. And it was with some considerable concern that we made the further discovery that kid boots are better for drawing-rooms. But in spite of shredded skirts and fraying boots, our ladies faced the slope with not even the faintest sign of fainting hearts.

An hour more, and we began to get views; views so wonderful as to make even the ladies forget their fluttering skirts and clogging petticoats and fast disintegrating boots. But now we bagan to have a choice of directions. We had never imagined there could be so many paths apparetly all leading to the mountain top, but we discovered that what had appeared to be an unbroken slope, was gashed by numerous deep gorges that forbade passage, and ever and again we were forced to double on our course and make long detours about these gulches. In the presence of one unuually

long, we determined that it was time for our second breakfast, to which we sat down, wondering whether there had ever been a first. A short rest, and we found ourselves with our stock of water sadly diminished, but our stock of courage and enthusiasm high as ever, and once more we set out for the peak whose location we began to guess at, but of whose distance away we could form no idea.

By noon the Professor announced, after a careful estimate of distances, that we were more than half way there, and that in an hour's time we should halt for lunch, which double announcement spurred those of the party who had been showing signs of weariness to a last heroic spurt. It was difficult to persuade any member of the party as we sat waiting for the baskets to be opened, that we had had one breakfast that morning, not to speak of two. After lunch the Professor declared that, having been brought up on a farm, he had been accustomed to a noon spell, and must have one. Being the least fatigued, or the most unwilling to acknowledge fatigue, this suggestion of a noon spell he could afford to make. So, stretched upon the broken rocks, we lay disposed at various angles, snuggled down into the soft spots of the old bony back. We slept for a full half-hour, and woke, so wonderful is this upper air, fresh and vigorous as in the morning. We packed our stuff, passed around our water-bottles, now, alas! almost empty, tied up the bleeding right foot of the Lady from Winnipeg with a portion of the fluttering skirt-remnants of the Lady from Montreal, seized our saplings, and once more faced the summit.

Far off a slight ledge appeared directly across our path. Should we make a detour to avoid it? Or was it surmountable? The Professor, supported by the majority of the party, decided for a detour to the left. The Missionary, supported by the Lady from Winnipeg, decided that the frontal attack was possible. In

half an hour, however, he found himself hanging to that ledge by his toe-nails and finger-tips, looking down into a gully full of what appeared to be stone, in alpine vocabulary *scree*, and sliding out into space at an angle of forty-five degrees or less, and the summit still far above him. Hanging there, there flashed across his mind for a moment the problem as to how the party could secure his mangled remains, and having secured them, how they could transport them down this mountain side. He decided that in the present situation his alpenstock added little to his safety and could well be dispensed with. As it clattered down upon the broken rocks far below, he found himself making a rapid calculation as to the depth of the drop and its effect upon the human frame. Before reaching a conclusion, he had begun edging his way backward, making the discovery that all mountain-climbers sooner or later make, that it is easier to follow your fingers with your toes, than your toes with your fingers. The descent accomplished, the Missionary with his loyal following reluctantly proceeded to follow the rest of the party, who had by this time gone round the head of the gulch, or the *couloir* in expert phrasing, and were some distance in advance. A stern chase is a long chase, and almost always disheartening. But in this case the advance guard were merciful, and, sitting down to enjoy the view, waited for the pursuing party to make up.

It is now late in the afternoon, and a council of war is held to decide whether, with all the return journey before us, it is safe to still attempt the peak. We have no experience in descending mountains, and, therefore, we cannot calculate the time required. The trail to the camp is quite unknown to us, and there is always the possibility of accident. Besides, while the climbing is not excessively steep, the going has become very difficult, for the slope is now one mass of *scree*, so that the whole face of the mountain moves with every step.

Still, the peak is very perceptibly nearer, and the party has endured already so much that it is exceedingly loath to accept defeat. Then, too, the atmosphere has become so rare, that the climbing is hard on the wind, as the Professor says. The ladies, despite shredded skirts and torn shoes, however, are keen to advance, and without waiting for further parley, gallantly strike out for the peak. It is decided to climb for an hour. So up we go, slipping, scrambling, panting, straining ever toward the peak. We have no time for views, though they are entrancing enough to almost make us content with what we have achieved. For an hour and then for half an hour, the ladies still in advance, we struggle upward. The climbing is now over snow and often upon hands and knees, but the *scree* is gone and the rock, where there is no snow, is solid.

At length the Professor demands a halt. In spite of desperate attempts at concealment, various members of the party are flying flags of distress. We are still several hundred yards from the coveted summit, but the rose tints upon the great ranges that sweep around are deepening to purple and the shadows lie thick in the valleys. If we only knew about the descent, we might risk another three-quarters of an hour. The ladies begin to share the anxiety of the men, knowing full well that it is they who constitute the serious element in the situation. With bitter reluctance they finally decide that they will not ask the men to assume any greater responsibility than they already bear. It is agreed that the men shall make a half-hour dash for the summit, while the ladies await their return. Stripping themselves of all incumbrances, the Professor and the Missionary make a final attempt to achieve the peak, the Californian gallantly offering to remain with the ladies. After a breathless, strenuous half-hour, the Professor, with the Missionary at his side, has fulfilled his threat and accomplished his proud boast. Breath-

less but triumphant, we are standing upon the head of the old Cascade.

We dare only take a few minutes to gaze about us, but these are enough to make indelible the picture before us. Down at our feet the wide valley of the Bow with its winding river, then range on range of snow-streaked mountains, with here and there mighty peaks rising high and white against the deep blue. One giant, whose head towers far above all his fellows, arrests the eye. There he stands in solitary grandeur. Not till years after do we learn that this is the mighty Assiniboine. But there are no words to paint these peaks. They are worth climbing to see, and once seen they are worth remembering. I close my eyes any day, and before me is spread out the vision of these sweeping ranges jutting up into all sorts of angles, and above them, lonely and white, the solitary sentinel, Assiniboine.

Without a word, we look our fill and turn to the descent. A hundred yards or more and we come upon our party who, with a reckless ambition, have been climbing after us. But the whole back of the Cascade lies now in shadow, and, though half an hour will do it, we dare not encourage them to take the risk. The party has been successful, though individuals have failed. And with this comfort in our hearts and with no small anxiety as to what awaits us, we set off down the slope. It is much easier than we have anticipated until we strike the *scree*. Here, for the first few steps, we proceed with great caution, but after a short time, becoming accustomed to have the whole mountain slip with us, we abandon ourselves to the exhilaration of tobogganning upon the skidding masses of broken rock; and touching here and there the high spots, as the Professor says, we make the descent with seven-leagued boots till we reach the timber. It is here we meet our first accident for the day. The Lady from

Winnipeg has the misfortune to turn her ankle. But there is no lack of bandages in the party. In fact, by this time the ladies' skirts consist chiefly of bandages, so that with foot well swathed, and stopping now and then for repairs to the ladies' boots, slipping, sliding, stumbling, leaping, we finally, in a more or less battered condition, arrive at camp. The indomitable Professor, aided by the Missionary and the Man from California, set about supper. But long ere it is ready the rest of the party are sound asleep. They are mercilessly dragged forth, however, to the refreshment of tea, toast and bacon, for which they are none too grateful, and after which they drop back upon their pine beds into dreamless sleep.

It takes us a full week, the greater part of it spent in bed, to realize that mountain-climbing, *sans* guides, *sans* mountaineering boots, *plus* petticoats, is a pastime for angels perhaps, but not for fools.

On the upper part of the mountain, the Professor and I were greatly excited over what appeared to be the fossil remains of a prehistoric monster, and if its jawbone had not weighed several hundred pounds—the backbone must have weighed several tons—we would have carried it down as a present to the Museum. We left them behind us, and they are there to this day for some anthropologist to see.

Photo, Mary M. Vaux

MOUNT BIDDLE AND LAKE McARTHUR

CAMPING IN THE CANADIAN ROCKIES

By Mary M. Vaux

We may take Laggan as a starting point, as more good trips are available from there than from any other point in the mountains. The trip may be either long or short, varying from a day's ride to Moraine lake or Paradise valley, a three-day excursion to Lake O'Hara and McArthur lake, to a week or more as far as the Pipestone pass, returning by the Bow. On any of these trips, it is well to make an elastic arrangement, so that one can stay a day or two longer than the actual time required; for there is much delight in a quiet day in camp, when you do not have to do your twelve miles on foot, or your fifteen miles on horseback, and can sleep as long in the morning as you wish, get acquainted with the flowers and birds, and enjoy the delights of a quiet walk; where there is really time to receive deep mental impressions.

For a four-days' trip, there is no place more delightful than Lake O'Hara—a lovely clear sheet of water, filtered through the rock slide at its head. Its banks are carpeted with flowers; in front are seen, in succession, Mts. Biddle, Hungabee, Yukness, Lefroy, Victoria, Huber, and Wiwaxy peaks, while behind come Cathedral, Stephen and Oderay; so that one is almost bewildered by the number and grandeur of them all. Then, a short walk of three miles brings you to Lake McArthur, a true alpine lake, with glaciers from the slopes of Mt. Biddle breaking off in miniature icebergs; and where the grassy moss-grown slopes are a favorite feeding ground of the mountain goat. Their beds and

rolling places are frequently seen; and the noise of falling rocks, as they climb to a point of vantage, aids you in discerning their retreating forms.

By following the stream that feeds Lake O'Hara, a beautiful chain of lakes is discovered, with cascades and waterfalls between, ending in Lake Oesa, whose surface is only melted for a very few weeks at mid-summer. Or, if one wishes a still higher climb, one can venture across Abbot pass (9000 feet above sea) and down the Victoria glacier to Lake Louise. But this is only safe with an experienced Swiss guide, as the pass is frequently traversed by avalanches on its northern side. Unfortunately, there are no fish in any of these waters, although it is stated that the lakes are well provided with trout-food.

From Hector station to Lake O'Hara it is about ten miles, over a good trail. The earlier miles are marred by burnt timber, but the lake and its surroundings well repay any discomfort of this part of the way. In addition, several other short excursions can be made to advantage, and a little exploring done on one's own account.

Now as to appliances and outfit: To begin with, a good tent is required, plenty of warm blankets, and a canvas sheet to spread under and over the blankets on the bough-bed, to prevent dampness from above and below; then, a small pillow is a great luxury, and takes but little room in the pack. Of course, it is presupposed that the women of the party wear rational clothes: knickerbockers, a flannel shirtwaist, and knotted kerchief at the neck; stout boots, with hobnails, laced to the knee, or arranged for puttees; woollen stockings, a felt hat with moderate brim, and a sweater or short coat completing the outfit. A light waterproof coat, opened well behind, to allow it to part over the horse's back, and which may be fastened to the saddle, is very necessary in a region where storms must be

expected frequently. Each person should be provided with a canvas bag, which can be securely buttoned, wherein to place the necessary toilet articles. An extra pair of light shoes, a short skirt to wear in camp and a golf cape with hood, add greatly to the comfort of the camper; also a good-sized piece of mosquito netting, to keep off intruding bulldogs, if you wish to rest in the tent in the heat of the mid-day sun; while a hot water bottle and a box of mustard may be tucked in along with a few simple medicines in case of emergency. On two occasions I would have given a great deal for a mustard plaster, and on a third occasion it was of great value.

The food taken is largely a matter for personal selection. We have eliminated canned things very largely, and find the change to dried foods not at all distasteful —of course, with the proviso that they are properly cooked. Bacon, ham, tea, coffee, evaporated cream, butter, oatmeal, rice, beans, flour, canned tomatoes, canned soup, onions, potatoes, pickles, marmalade, cheese and dried fruits can be so prepared that, with hunger sauce, there is nothing left to be desired in the way of a larger bill of fare. Trout and game are always a welcome addition to the larder. Cakes of chocolate and raisins may be added to the list, when it is desirable to have something in the pocket on a day's climb, and the return to camp is uncertain. In all preparations it must be remembered that the altitude at which we camp is considerable, and that a necessary attribute towards a good time is to be warm and comfortable at night, when the thermometer may probably fall to 28°, and there will be ice along the brook-sides, in the morning. Then, do not forget the cold dip in the mountain stream, as the crowning luxury of all.

A camera is a very delightful adjunct, for it is pleasant to have some tangible results to show, on your return home. A kodak, if no larger instrument can be

managed, yields most satisfactory results, although the better records from a larger-sized camera are an increased delight, when one has the patience and skill to obtain them. For changing plates in camp, an improvised tepee can be made of the blankets, and, if this is done after sundown, is quite satisfactory. We have never known plates to be fogged by the operation. Cut films are more convenient than glass plates, as they are so much lighter and not subject to breakage, although not so easily handled. The actinic properties of the light are very great and care must be used to avoid over-exposure. It is very desirable to develope the plates as soon as possible, for in this way you can more readily understand the conditions and change the exposures to suit. We have found medium plates better than the quick ones, especially with a rapid lens. Telephoto work has not been very satisfactory, as on high places the wind is so great that it is not possible to obtain a sharp picture, with the unsteady condition of the camera, when the long draw is in use. We have also found that panoramas, made with the ordinary camera, give a better idea of extended views than can be had by any other method. The panoram cameras, as a rule, distort so much that they are useless when great heights and depths are to be rendered.

Then, when you return to civilization, you will have many happy memories, and the "call of the wild" will so enter your blood, that you will count the days till you can again be free among the everlasting hills.

Photo, Frank Yeigh

AROUND THE CAMP FIRE

Photo, D. Warner

CROSSING TWIN FALLS CREEK—YOHO VALLEY TRAIL

Mountaineering Section.

THE ASCENT OF MT. GOODSIR

By Charles E. Fay

I well remember how deeply I was impressed at the time of my first visit to the Canadian Alps in 1890 by the sight of the superb Ottertail range, as the east-bound train approached the old bridge over the creek of that name, and the peculiarly alpine features of the range were revealed, with the portentous towers of Mt. Goodsir looming in the distant background. Though we had just passed a glorious day at Glacier House and had revelled in the grandeur that the intervening journey offers in so rich measure, this seemed the fitting climax. Little did I suspect that I was to return to these scenes again and again, that I was even destined to be of the first party to scale the frowning, glacier-crowned rampart dividing the Ottertail from the Ice River valley, to tread the virgin snows of the summit of Mt. Vaux, and to have the alternate experiences of failure and success in assaulting the highest peak of the monarch of them all.

At that time the name of Goodsir was, to be sure, on the Palliser map, but it was not yet generally recognized as belonging to the mass that now bears this name. Indeed, it is more than doubtful whether Dr. Hector intended to apply it here, and not rather to some peak of the Bow range.* In the first photograph of it that I saw on sale in those early years, the massif was entitled "The Beaverfoot Mountains." In his

* See Appalachia, vol. xi, p. 131.

report to the Minister of the Interior for 1887, Mr. McArthur, of the Topographical Survey, mentions its triad of summits as the "Three Sister Peaks," and then says: "The 'Three Peaks,' as I have named them, are the highest that are established by my survey, the western one towering 11,000 feet above the sea." Later measurements have not diminished its relative height, but have accorded it an altitude of 11,676 feet, making it thus the highest of the Canadian peaks south of the line of the railway, or indeed north of it until one reaches the great peaks near the sources of the Athabaska.

Little wonder, then, that it made an early appeal to the alpine instinct growing stronger in me with each new visit to that inspiring region. But it was not until the year 1901 that an opportunity offered to make a real assault upon it. Kind Fortune gave me as companions two men of utterly different mould, yet pleasantly complementing one another—the Rev. James Outram and Mr. J. H. Scattergood—both athletes of the intellectual type, both accustomed to physical conquests, one twenty, the other thirty years my junior—but for that glorious week we were all of one age. It joined to us as our guide the honest, kind and trustworthy Christian Hasler, under whose leadership Professor Parker and I had already, two years before, scaled Mt. Dawson.

Our main camp was to be established in Ice River valley, and around to it we sent Ross Peecock by way of the Beaverfoot valley. This was as yet traversed by nothing more definite than an old Indian trail, but almost immediately was to furnish ready access to Ice river by a good wagon road. The troubles Scattergood had endured there, the year before, he has narrated in Appalachia.* We ourselves were to leave the railway at the bridge over Ottertail creek and make

* Vol. ix, p. 289*f*.

our way to a bivouac at timber-line at the high sources of Haskins creek, just below a promising looking cleft at the rear of Mt. Hurd. From here we hoped, with an early start, to find a lead up to the ice-field that covers the broad eastern slope of Mt. Vaux, to scale its virgin summit, and thence to find our way down to the Ice river by the glaciers sweeping southward. And all this, with numerous other unexpected details, we accomplished with perfect success, turning up at our camp in the late afternoon of our second day.

Up to that time, as far as I am aware, none but prospectors had visited this upper portion of the Ice River valley. Our camp was at the southern edge of a large meadowy glade of perhaps ten acres in extent, possibly a mile and a half above the junction of the stream from Zinc gulch and the main stream. It was a beautiful pastoral picture, with the pack horses browsing in the plentiful herbage—the more striking from its wild surroundings and the news that a grizzly bear had accorded but a surly welcome to Ross on his arrival a few hours before. Studying his plantigrade tracks in the gravel of the river bed, photographing the unfamiliar aspect of the Chancellor and other leading features of the picture, and refreshing ourselves in general idleness from the somewhat strenuous labors of the day before, we passed the forenoon, and soon after our simple dinner we set forth for the high bivouac from which we should make our attack on Goodsir the following day. To reach it, we followed a short distance down the valley, then up the eastern sloping path of an avalanche, overgrown with rank hellibore—a torrid stretch,—then over the crest of this ridge and across the torrent-washed rubble of the ravine from which spring the two great towers.

At about 7000 feet and at the very base of a spur from the southern, higher peak, near to a refreshing rill, we found two gnarled firs with ample tops, promis-

ing a tolerable shelter in case of a sudden shower, and under these we spread our blankets with good hope for the morrow. The sun set clear, the stars gleamed with joyous brightness, and with such omens we saw ourselves already the victors over the untamed monster at whose feet we dared to lie so serenely. But "man proposes."

At crisp daylight we were astir, and after a formal breakfast set out at a good pace over the lower flanks of the first ridge south of our bivouac. The evidences of the earlier presence of the gold-hunter were about us; indeed we had been fully twenty minutes under way before we passed the last trace of such a visitation, a claim-stake with the name of the prospector and the bounds of his claim. We merely gave it a sidelong glance in passing, for it seeed to have been tacitly agreed that no one of the three should first call a halt, so that it was fully an hour before we made our first stop, and then for the purpose of putting on the rope at the beginning of the first real climbing. Still it had not been severe, save as a test of lung power.

Considerable snow lay at the base of the rocks we skirted, and unfortunately it was soft and little promising. At about 10,000 feet, not far, if I remember, above where one ridge joins another striking more to the south, we paused for our second breakfast. Things were now growing more interesting. A superb prospect had opened over the western ridge of the Ice River valley to the gleaming snows of the limitless line of the Selkirks, and near at hand were the forbidding crags and cornices of our own peak. Just above us rose the snowy shoulder over which we were to pass, and from that rose a steep cliff seen in all our reconnaissances, which was apparently the chief obstacle in the way of our success.

Again getting under way, we soon were upon that shoulder, and anon making our way under most tick-

lish conditions to the base of the hindering cliff. A narrow arête of several rods in length connected it with the snow shoulder, and this arête was itself ominously corniced, and with snow in a most treacherous state. Seldom have I seen Hasler so trepidant, so insistent that the ice-axes should be so planted as not to serve as levers to start a crack that would imperil the entire party, should the cornice fall; but, in good time, we were standing at the base of the cliff.

On either side of us, steep couloirs swept down thousands of feet; before us rose this beetling face of dark rock, with little snow-patches here and there revealing possible stations, between which only cracks and slight protuberances offered scanty holds for foot and hand. Hasler led off and attained the first anchorage; then Scattergood boldly followed. My turn came next, and I remember having some doubts as to the entire safety of the sport of alpinism for the next few minutes; indeed, for the next half hour. On my reaching the anchorage, the same tactics were repeated by the first two, after which Outram came up to my level, and I then went forward. Our third station brought us to the top of the cliff—and to the end of our ascent.

A most ominous situation revealed itself. The final peak was before us, and its summit hardly three hundred feet distant—a great white hissing mass,—a precipice on the hidden left side, a steep snowslope of perhaps 65 to 70 degrees on the right. Under the July sun its whole surface was seemingly in a state of flux, slipping over the underlying mass with a constant, threatening hiss. A second narrow arête led across to this final summit. This, too, was corniced, and in a remarkable way. The swirl of the wind had produced an unusual spectacle. At the beginning and at the end, the cornice hung out to the right; in the middle, a reversed section of it overhung the abyss on the left.

THE SUMMIT OF MOUNT GOODSIR
SOUTH TOWER

THE NORTH GABLE OF THE SOUTH TOWER
MOUNT GOODSIR

The two similar ones could doubtless have been passed. To cross the middle of the section meant trusting ourselves to the sun-beaten slope already in avalanching condition. Indeed, while we studied it, and as if to furnish the final argument to our debate, the snow on our right impinging against the cornice, well back upon which Hasler was standing, broke away, and down went a well-developed avalanche a couple of thousand feet over that much-tilted surface, and vanished in a sheer plunge that landed it perhaps three thousand feet below that. It was a suggestive and persuasive sight. Feeling sure that we had seen enough for one day, we beat a careful retreat. With even greater caution we descended the cliff in reversed order, and, with well-justified trepidation, returned over the treacherous arête to the snowy shoulder. Never did I feel less certain of the safe outcome of a climb, or breathe more freely on leaving snow, surely the worst condition in which it was ever my fortune to meet it. We glissaded down the lower greasy snows, made good time below our bivouac, and dusk found us with colossal appetites back at the lower camp and Ross's bannocks. And so, repulsed, we turned our back on the sullen mountain, yet harboring intentions of getting even with it on some future occasion.

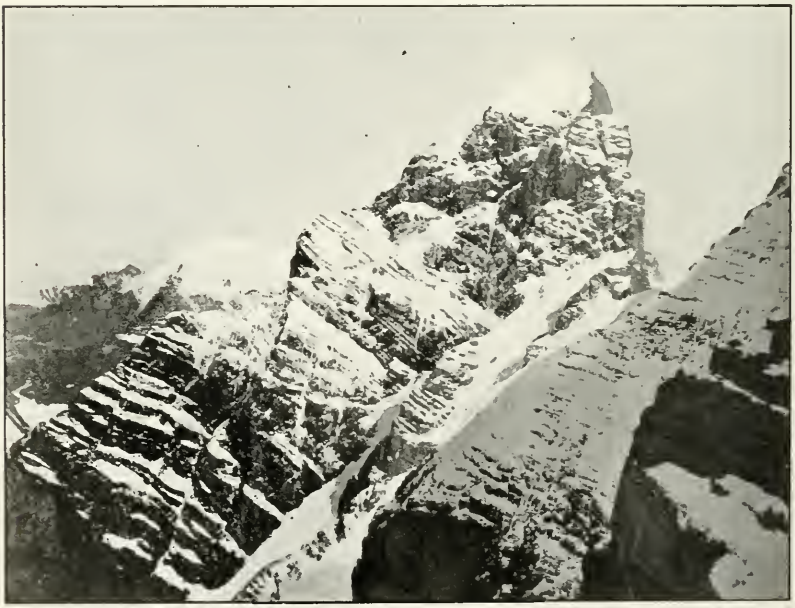
None offered the following year, but, in 1903, my friend Parker, just back at Field from an unsuccessful try at Goodsir with the two Kaufmanns as guides, wrote me of their discomfiture by reason of a heavy snowfall encountered at about 10,000 feet, invited me to hurry out from the East and join him in another attempt, as soon as the melting of the snow would permit. No urging was necessary. I came with all haste, and at once we were under way, with Christian Kaufmann and Hasler as guides. We were encamped well into the Ice River valley by six o'clock of the day on which we left Leanchoil at noon; such was our

eagerness, and such the quick access by the new wagon road. The following day we moved our camp up into Zinc gulch; starting in summer heat and meeting a chill blast with snow squalls as we arrived at our chosen camping spot shortly after noon. This camp was almost at the identical height of the bivouac of 1901, but south of the great peak. Dubious weather conditions prevailed for the rest of the day; but we turned in early with good hopes for the morrow, which were dashed about two o'clock by Kaufmann's report that it was snowing. Morning revealed a picture more appropriate to Christmas than to mid-July. The evergreens were bearing wintry loads of wet snow, and the grey sky gave little promise of good weather. In any event, Goodsir was secure from assault for the present; for how long it was impossible to say. Many inches must have fallen higher up, and, of course, prudence counselled awaiting its disappearance. We had come relying on steady atmospheric conditions, intending to make quick work of it, and so were scantily furnished with supplies. Fortunately, Nixon, our outfitter, had come along with us on his handsome grey, rather for an outing than for business. After a brief council, he was despatched back to Leanchoil to send up supplies for a prolonged siege. It was now or never.

As the day wore on, the sun came out, and to our great relief, we saw the clinging snows on the peak diminish hour by hour, as we studied it in a practice-climb to the col joining "Little Goodsir"—the third "Sister"—to Zinc mountain, whose crags rose above our camp on the south. It was soaring just above these that the waning moon looked down on our party on the following morning—July 16th—as we prepared our breakfast. By the first good daylight we were under way. The first hour was similar to that of our climb of two years before, and led us up to our roping place on that occasion. In general, our course from

Photo, H. C. Parker

THE SWISS GUIDES CHRISTIAN AND HANS KAUFMANN,
WHO ACCOMPANIED PROFESSOR H. C. PARKER
ON THE SUMMIT OF MOUNT HUNGABEE



Photo, Chas. E. Fay

THE NORTH TOWER OF MOUNT GOODSIR

here to the cliff was identical with that of the former trip, but, to our great satisfaction, the snow was in perfect condition, and so remained the entire day. Accordingly, we made sufficiently good time, with the same stops as before. The arête from the shoulder to the base of the cliff was now child's play. The cliff was the same old story, though I recall one variant—the hand and foot holds on one occasion lost their grip on the man passing between the first two anchorages, and left him for a moment in a state of what might be called "suspended animation." Arriving at the top, all was changed from the conditions of 1901. The broken arête was indeed under a draping of recent snow, but no cornice was in evidence. It was "plain sailing"—and yet very interesting, for the arête was so narrow and thin that one astride it could have his left leg vertical over a sheer drop, at first indeed overhanging, of hundreds if not thousands of feet, while its mate pointed down that 70° slope of snow, as silent now as it was noisy in 1901. At eleven o'clock we were on the summit—Goodsir was ours. The repulse of two years before was forgotten, and our affections went out to the graceful peak, no longer a sullen monster, and, for the joys of that one glorious hour spent on its pure snowy summit, we granted it our love for a lifetime.

THE ASCENT OF MT. HUNGABEE

By Herschel C. Parker

On August 3rd, 1897, it was my good fortune to be a member of the party that made the first ascent of Mt. Lefroy.

During this trip, from Abbot pass and the summit of Lefroy, we gained splendid views of the grim cliffs and lofty summit of the great "Chieftain." I think some of the party must have felt, even at this time, a strong desire to conquer so fine a peak.

I made a rapid trip through the Canadian mountains in the summer of 1899, but had little opportunity for climbing. Through the courtesy of my friend, Professor Fay, however, I was able to join him in the first ascent of Mt. Dawson. When I returned to the Canadian Alps in the summer of 1903, prepared for serious climbing, I found that four of the most notable peaks remained unclimbed: Mts. Hungabee, Deltaform, Goodsir, and Biddle.

After the "Conquest of Mt. Goodsir" on July 16th, I returned to Lake Louise, and with Christian and Hans Kaufmann prepared for an attack on Mt. Hungabee. It may be remembered that Mr. Thompson and Mr. Weed, with Hans Kaufmann as guide, had made a gallant attempt on the mountain some time before this, but when near the summit the climbing became so difficult that they were compelled to turn back. For a long time, and from many points of view, Christian told me he had carefully studied the mountain and decided on what should be the exact route of ascent. While the lower portion of this route probably presented considerably greater difficulties than the one

previously attempted, it appeared to offer a good chance of attaining the final summit. I think, in giving a short account of the climb, I can scracely do better than quote from an article I wrote for "Appalachia" a short time after the trip was made.

On the morning of July 20th, with a week's provisions, silk tent, and mountaineering equipment, we made a rather late start from Lake Louise. A packhorse carried most of our "impedimenta" as far as Moraine lake. Here, assuming the heaviest of packs, we proceeded slowly up the Valley of the Ten Peaks, and, crossing the high pass between Neptuak and Hungabee, made a rapid descent to Prospector's valley, where we arrived in good time to make camp.

Leaving camp next morning at 3.50, we made our way up Prospector's valley to within about a quarter of a mile of the Opabin pass, whence, taking to an arête, we had a fairly easy and interesting climb of possibly two thousand feet. At this point further progress was barred by a wall of vertical cliffs. Directly in our path this rocky battlement was broken by a narrow icy couloir and a much narrower chimney filled with ice. After inspecting the couloir, Christian decided that the chimney would be the safer means of ascent, and so, after seeing that Hans and I were in as secure positions as the circumstances would permit, and with directions not to move from our places close against the rock, he disappeared around an angle and commenced the perilous climb.

It was only by watching the rope that Hans and I could judge the progress Christian was making above us. For minutes at a time, it seemed, the rope would be motionless, then inch by inch it would slowly disappear up the chimney, and the crash of falling rocks and ice would warn us that we must cling even more closely and find what protection we could beneath the rocky wall.

At last Christian gave the signal that I was to follow, first cautioning me most earnestly not to knock any rocks down on his brother Hans, for a slight mishap to any member of the party in a position like ours might mean a catastrophe for all. A short space of breathless effort, a strong pull on the rope from Christian, and I stood by his side at the top of the chimney. Then, slowly and carefully, Hans made his way up and joined us.

Above us we could see a smooth, steep slope leading to the final summit arête. This slope consisted of snow, covering treacherous rock, but, thus early in the morning and while in shadow, it was in fine condition, and we made our way easily to the great shoulder of the mountain just under the final peak and almost overhanging Paradise valley. On this shoulder, a second breakfast was eaten, and we anxiously studied the route that we must follow. The summit was only a few hundred feet above us, but the arête, broken by vertical cliffs at this point, was impossible to scale. We had only one alternative left, to make an exciting traverse over a tremendously steep snow-slope at the base of these cliffs, and so reach the final cone.

We did not discuss the possible dangers of such a course, but cautiously made our way beneath the cliffs, turned a most sensational corner almost in mid-air above Paradise valley, and then scaled a nearly perpendicular cliff by means of a convenient crack. We were now on the arête but a very short distance from the summit. Only one more difficulty confronted us: a narrow "gabel," or break in the arête, only a few feet in width, it is true, but with a nearly sheer descent of thousands of feet on either side. This gabel must be crossed to reach the summit. The arête was far too narrow to allow a jump being made with safety; so, slowly and carefully, while firmly grasping the rock on one side, Christian thrust his feet forward until they

Photo, Chas. E. Fay

THE CLIFF AND SUMMIT OF MOUNT GOODSIR (11.676 FT.)
AS SEEN IN 1901

Photo, H. C. Parker

THE SUMMIT OF MOUNT HUNGABEE (11.447 FT.) SHOWING
FOOTPRINTS OF THE TRAVERSE

touched the other and his body bridged the chasm; then a strong forward swing, and he stood safely beyond the gap. For me, aided by the rope, the matter was far less difficult, and soon we made our way over the intervening arête, gained the corniced summit, and Hungabee, the grim old "Chieftain," at last was conquered.

It was now 10.40 a.m., almost exactly seven hours since we left camp, and Christian warned us that we should not stay long, on account of the dangerous snow-slopes we must cross on our return. Hans wished me, however, to determine the altitude by means of the hypsometer, so I "boiled a thermometer," a proceeding which, on account of the high wind, consumed some time, so that it was nearly an hour later when we were finally ready to start downward. We reached the point where we had halted for breakfast, without difficulty, but from here down the hot sun beating on the snow was fast changing it to the consistency of slush, which threatened to avalanche at any moment. We crossed this safely, however, and arrived at the rocky shoulder just above the chimney. It seemed to me hardly more than three minutes after we had left the snow-slope before a portion of it, including almost our very footsteps, slid downward and disappeared over the cliffs below us.

The descent of the chimney was not an inviting proposition, for the condition had entirely changed since morning, and it was now spouting water. We did not hesitate long, but descended as rapidly as possible and soon emerged at the other end, somewhat wet but very happy, for now our difficulties were at an end. From here the way was comparatively easy, and camp was reached about six o'clock, after a most entertaining and glorious day.

The difficulties of any expedition, no matter how serious, always appear to diminish with the years

through which we look back at them, and so, at the present time, I cannot accurately estimate the quality of this climb. Under certain conditions, for example: if the "chimney" should be free from ice and the slopes above from snow, two of the greatest difficulties would certainly be removed. It seems to me, however, that the ascent of Mt. Hungabee can never prove to be an easy one, and that it will always be found a most interesting climb for the expert mountaineer.

THE ASCENT OF MT. BALL

By John D. Patterson

It came about in this way:

On the 31st of May, 1904, journeying from Calgary to Glacier, in the hope of spending an idle day or two under the hospitable roof of Glacier House, and while the train was making its usual twenty-minute stop at Field, I had the good fortune to see in an eddy of the crowd which was swirling restlessly along the station platform, the bronzed, cheery faces of those sturdy Swiss mountaineers and guides, the Kaufmanns—Christian and Hans.

My resolution to spend but two days in the mountains and to do no climbing so early in the season, was not proof against the call of the Rockies that came with the warm hand clasps of those friends of the previous summer, and "Is the snow in good condition?" seemed under the circumstances, the only possible greeting.

That the snow was not "good" did not matter, when Hans, following my inquiring gaze to the top of the mountain in the shadow of which Field is so comfortably tucked away, said that we might try Mt. Stephen. Five minutes later my bags, recovered from various parts of the train, were being carried to a room in the Mt. Stephen House.

In the evening of the following day, content in the successful ascent of Stephen, our conversation naturally turned to the mountains, and to a discussion of the virgin peaks within easy reach of the railroad. Mt. Ball and the north tower of Mt. Goodsir were, in the estimation of the guides, best worth attempting, and of these two, Christian, doubtless influenced, good sportsman that he was, by the memory of his defeat

when, with Mr. Edward Whymper's party, three years previously, an unsuccessful effort had been made to reach the summit of Mt. Ball, declared it to be the better mountain.

All this could have, of course, but one ending. The journey to Glacier was abandoned, and before the afternoon of June 2nd was far advanced, a little pack train of four horses was on the trail from Banff to Castle Mountain station, where, alighting from the train early next monring, we found it awaiting our arrival.

While the packs were being adjusted, the guides found a man—Joe Smith—to ferry them over the Bow river, and at once started off, agreeing to meet the ponies on the trail not far from the mouth of Little Vermilion creek. This proved a fortunate arrangement, for the water at the ford was so deep that the horses had to swim, and on account of the swift current they could carry only light packs. Two crossings had to be made before our small amount of impedimenta, the packer and myself were safely landed on the opposite bank.

The trail to Vermilion pass lay along the north side of Little Vermilion creek, and was frequently intersected by timber roads leading to the camps long ago deserted, though doubtless busy enough in the days when ties and bridge timbers were being secured for the construction of the railway.

A bridge in fair repair, about five miles from its mouth, made easy the crossing of the turbulent creek. Between the bridge and the pass we followed the shore of a little lake which, our packer assured us, could always be relied upon to yield a fair basket of trout.

A good deal of snow was encountered in the pass, and the ponies which had not been halted for a midday feed and rest, gave evidence that the work was telling on them. Once well over the summit, however, the

trail was better; the two miles to Mr. Whymper's former camping ground was quickly negotiated, and free of their packs, the tired animals were soon quietly feeding in the abundant grasses at the foot of the slide opposite the camp.

It was now four o'clock; eight hours had been required to cover the ten or twelve miles that lay between us and the railroad.

The trail over which we came had an especial interest, as we realized that we were following the footsteps of Sir James Hector, then Dr. Hector, who had given to Mt. Ball its name, when in 1858, with the Palliser expedition, he had crossed the Vermilion pass on his way to the Kootenay.

Reluctantly enough, we turned out of our blankets at two o'clock on the morning of June 4th, and at three precisely, in the uncertain light, we commenced our climb. The way led through timber, thick at first, but gradually becoming more open as we made our way upwards. This forest had apparently never been burned over, and everywhere the ground, the fallen trees and the rocks were deeply covered with thick mosses.

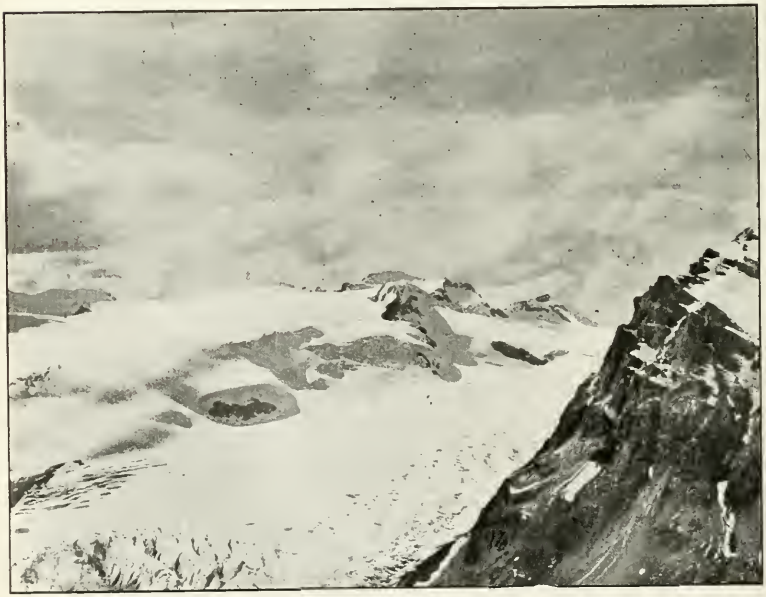
The guides, yesterday so cheerful and talkative, were now as silent almost as the trees about us. Earnest work was ahead, and it was delightful to observe their keen eyes noting every fragment of the mountains appearing through the open spaces. No one had ever gone that way. Landmarks might be valuable before the day was done.

An hour or more had gone, when at timber-line a low rock wall, easily surmounted, brought us well upon the buttress at the west flank of Mt. Ball. The ledge upon which we landed was wide, but covered with scree to an extent that made the going slow, and when the slope was at all pronounced, somewhat uncomfortable.

About nine o'clock we rested for a few minutes, and shortly afterwards came to a snow-field from which we had a good view of Storm mountain, and could see the route taken by Mr. Whymper in 1901. From this point we kept to the arête, and had some interesting rock work because of the loose snow, which made it impossible often to ascertain the condition of the rocks in which we were seeking to establish hand and foot-holds. At eleven o'clock, upon leaving a small table, from which we enjoyed extended views to the north-east and south-west, we found a col lying between it and the mass of the mountain crowned by the summit —our goal,— and owing to the treacherous condition of the snow, the very crest of this col, sharp as it was, had to be followed. Fortunately it was not more than forty feet across, for even with the confidence which the rope inspired, it was far from pleasant with such uncertain footing, either to look down upon the precipitous snow-field to the one side, or at the short and hardly less steep slide terminating at the edge of a perpendicular rock wall, on the other. From this point the ascent was more rapid, and no further difficulty was experienced until we arrived at the edge of a snow-field leading to a saddle about 150 feet below the summit. From the earnest conversation of the guides, held in their own language, which I did not understand, it was evident they feared that the snow might avalanche if an attempt were made to cross it. Consequently, we kept close to the wall marking the western edge of this field, and by clinging to projections from the rock and cutting steps in the bergschrund when opportunity offered, we climbed the steepest part of the slope and then quickly made our way to the saddle.

Upon rounding a bastion at the point where we came to the edge of the snow-field, just referred to, it was evident that we should succeed in getting to the top, but from the saddle itself we had our first view of

MOUNT BALL FROM STORM MOUNT



THE WAPTA ICEFIELD—MOUNT COLLIE IN DISTANCE

the actual summit, which too evidently was upon the cornice overhanging the northerly face of the mountain. The extent of the overhang and the probable security of the huge cornice were carefully noted, and as soon as the final climb up the rounded side of the snow-field lying above us was made, we were happily congratulating one another upon having accomplished the first ascent of Mt. Ball. Before venturing upon the cornice, I left my place in the middle of the rope and had an end made fast to me to enable the guides to anchor as far back as possible, while upon hands and knees to guard against breaking through the crust, I made my way to the actual crest of the mountain, 10,825 feet. It was then 12:35 o'clock, or nine hours and thirty-five minutes since we left camp. The weather was clear and we were favored with good views of the peaks in the surrounding ranges.

The conformation of Hungabee, and especially of Deltaform, made them easily distinguishable among the Ten Peaks. In the direction of Mt. Assiniboine the atmosphere was comparatively thick, and we did not have a satisfactory view of that splendid mountain. As there were no stones at the top, we built a cairn at a point where the rock outcropped on the saddle just below, and then, luncheon finished, we spent a considerable time in looking at the interesting crevasses in the glacier lying under the north face of the mountain and in examining the massive cornice overhanging the glacier on the mountain top. A suggestion of this most interesting feature may be had through a reference to the accompanying photograph, taken in connection with his topographical work, and kindly supplied by Arthur O. Wheeler, F.R.G.S., etc.

We arrived in camp again at about six o'clock, having made the descent without noteworthy incident, in five hours.

THE ASCENT OF MT. ASSINIBOINE

By Gertrude E. Benham

We—that is, Christian and Hans Kaufmann (Swiss guides) and myself—left Laggan at 9 a.m. on August 1st and travelled on No. 96 as far as Banff, where Bill Peyto, who was outfitting our party, met us and escorted us up to his house, to wait while the final arrangements were being completed. About noon the cavalcade started, our party consisting of Christian, Hans and myself, Jimmy Wood and Jesse Trot, packers, and seven horses—Jimmy riding on Pet, Peyto's beautiful mare, who was accompanied by her little foal Baby; Jesse on Toby; Grey, for my use; the guides taking it in turns to ride Wilcox, while Cree, Pinto and Buckskin carried the packs. I walked for the first four or five miles, much to Jimmy's astonishment, and he kept inquiring about every half mile if I was not tired, but at last I was obliged to mount, to cross a creek. Soon after four o'clock, we reached the place where our first camp was to be, and which is generally known as Porcupine camp, though that name might apply equally well to any other place where I have camped in the Rockies, as porcupines abound everywhere. Christian and Hans put up the tents and cut boughs for our beds, while Jimmy unsaddled and hobbled the horses, and Jesse made a fire and fetched water in preparation for our evening meal. This over, and everything washed and tidied up, we sat and rested for a while before retiring to bed, the men enjoying their pipes, while I knitted. We fastened the tents well down, all round, with logs and stones, to prevent the

porcupines coming in. It was a good thing we did so, as I heard them walking round several times during the night, their quills scratching against the canvas. They and the gophers are very destructive, especially to leather, and we had always to be very careful to leave nothing out at night where they could get at it.

The next morning we were up at five o'clock, as breaking up camp, fetching and packing the horses, etc., usually takes some time, to say nothing of cooking and eating breakfast, and it was generally eight o'clock before we got started on our day's march. The first part of our second day's journey was through pine forests, where, however, there was a good trail, though somewhat steep in places. We climbed up to Simpson's pass, and about eleven o'clock reached a wide, grassy plateau surrounded by hills with patches of snow here and there. About mid-day we made a short halt for lunch, but did not stop to unsaddle the horses, as we wanted to reach the camping-place at the foot of Burnt Timber hill, that night if possible. Our luncheon place was in a garden of purple asters and other mountain flowers, which added beauty to the scene, but we did not stay longer than was necessary, and soon continued our journey over the summit of the pass to Burnt Timber hill. This hill, as its name implies, is covered with the remains of trees all charred and dead by some long-ago fire, many of them fallen to the ground, often several one on another, while others are so unsteady that it would not need much to make them fall also; so that, in addition to the hill being very steep, it is very bad going, especially for the horses. However, we all arrived at the bottom, without any mishap, and were soon busy fixing our camp for the night. After supper, Jimmy amused himself by catching a gopher, with a noose of string which he placed outside its hole, and then when it put its head out, he drew the string and the gopher was

caught. After we had kept it a little while I let it go, and it ran down its hole, dragging the whole length of string with it, and then there was a great commotion in gopher-land—such squeaking, while I suppose he was telling his adventures to his family. The next day's march was varied by the behavior of Pinto, one of the pack horses. When we came out of the forest into the open, he took it into his head to roll, and this loosened his pack and sent it to one side, so he set to work to kick it off, and we saw our things flying in all directions. Fortunately the boxes of provisions, which he had carried the previous day, had been put on Cree, or else everything would have been smashed; but, as it was, nothing was damaged, as he was only carrying tents and bedding. When he had got rid of his pack, he bolted, and both Jimmy and Jesse had a long chase before they could catch him, and they began to fear they had lost him. Although we had seen Mt. Assiniboine in the distance from Simpson's pass, it did not come into view again till we were nearly through our last day's march, and then we saw it in all its grandeur and beauty. It stands on an undulating, grassy upland, dotted here and there with groups of pine-trees, with a beautiful lake lying at its foot, while the lower peaks around seem to add to the height and majesty. We made our camp as near to the base as possible, so as to shorten our climb the next day, and then set to work to prepare dinner, for which we were all ready. The weather, scenery and everything were delightful, but the mosquitoes and bull-dogs were very much the reverse. I suppose they do not get many visitors, so they make the most of those who do come. During the daytime the bull-dogs (very large horse flies) came around in hundreds. The poor horses were bitten by them till the blood flowed. Jimmy made a "smudge," around which the horses crowded to try and get a little relief from their tormentors, but it takes a good deal to

keep off a bull-dog, and when he is once settled nothing short of a hard hit will move him.

The bull-dogs struck work during the afternoon, but almost before they had left, the mosquitoes began, and I think they were worse, for they kept on during the night.

At three o'clock next morning, Christian called me and I got up, but we had not brought any candles with us, and dressing in a tent in the dark is a somewhat difficult operation. However, after groping and feeling round, I found all my necessary things, and then went out to breakfast by firelight, the moon being in the last quarter did not give us much light. At four o'clock we three started. We went up a very steep snow-slope, which required some step-cutting, as the snow was so hard, and near the top there was a good deal of danger from falling stones. After we had reached the glacier, we had a fairly level stretch around the base of the peak to the ridge on the right hand, which we crossed and descended into a snow-basin on the other side. We then traversed a snow-slope and loose stones and rock till we were right round the farther side of the mountain and could find a practicable ridge by which to reach the summit. Some of the rocks were covered with ice, which made climbing very difficult, but on our descent the sun had turned the ice to water, and we got several shower-baths. The rocks were very rotten and interspersed with patches of snow and ice; and, when coming down, the snow was in such bad condition that we dared not trust it; so, accordingly, had to come by a different route to that by which we had gone up. When nearing the top, we thought possibly the other side of the ridge might be an easier way of ascent. Our present route lay chiefly along steep slabs of rock covered with loose stones, and here and there patches of ice which necessitated step-cutting. Accordingly, we worked our way to where

there was a narrow cleft between two high rocks, but when we could look over, we saw the other side was a sheer precipice, with no hand-hold or foot-hold possible, so we had to retrace our steps and continue the traverse over the stones and ice. When near the ridge, we found the remains of a mountain-rat or some small animal, with teeth and claws and fur still good, which had evidently been dropped by some large bird, as no animal could have lived up there. We reached the summit at two p.m. but though the day was cloudless there was too much smoke from forest-fires, in the horizon, to get a very distant view. The summit was much corniced, so we gave it a wide berth, and after a short stay began the descent.

Having no lantern with us, we hurried on, as we did not want to be benighted on the mountain, but the loose stones made care necessary and we did not reach our camp till 8:45 p.m., just as night was setting in. Jimmy and Jesse were on the lookout, and fired their gun when they saw us on the snow-slope, and when we arrived in camp we found a nice hot supper all ready.

EDITORIAL NOTE.

Miss Gertrude E. Benham's modest and unassuming account of her ascent of Mt. Assiniboine would not lead the reader to suppose that she was the first and only lady to set foot upon its summit, 11,860 feet above the sea.

Although several attempts had been made, the summit was not reached until 1901, when the Rev. James Outram, accompanied by the Swiss guides, Christian Hasler and Christian Bohren made the first ascent (see "In the Heart of the Canadian Rockies," by the Rev. James Outram, published by MacMillan & Co., New York). But one other party made the ascent between that by Mr. Outram in 1901 and by Miss Benham in 1904.

Presumably, Miss Benham's wonderful record of mountains climbed in the European Alps, in New Zealand and in Japan, the first including among one hundred and sixty climbs, Mont Blanc, the Matterhorn, Monte Rosa the Weisshorn and the Jungfrau, has lead her to regard but lightly her ascent of Mt. Assiniboine.

Photo, Francklyn

MOUNT ASSINIBOINE, SHOWING NORTH AND EAST FACES

THE ASCENT OF MT. HERMIT

By the Rev. S. H. Gray

Few travellers on the west-bound Canadian Pacific express will forget the impressive moment when the train enters the giant gateway that opens to Rogers pass, the railway summit of the Selkirks. Rising on either hand are the towering masses of Mts. Tupper and Macdonald. This is Rogers pass, and the little station which bears that name is close by the summit. Looking back, as the train descends the grade to Glacier House, one commands an inspiring view of the Hermit range, of which Mt. Tupper is the beginning. The next to attract his notice is the compact group of peaks known as Mt. Rogers. Between this group and Tupper, and modestly receding into the background, is a well-knit and shapely rock-mass, with a fine apron of névé spread beneath it, called Hermit mountain. Possibly there is something in the name and the more apparent loneliness of the peak that invites acquaintance. At any rate, it had an attraction for the Rev. Dr. Herdman, whose enthusiasm was contagious enough to induce the Rev. A. M. Gordon and myself to join him in an attempt to climb it. Hermit, as far as we knew, had never been climbed, and that added to our zeal.

We met at Glacier House on the afternoon of August 3rd, 1904. After enjoying a good meal at the hospitable house, we set forth on a five-mile walk to Rogers pass. Edouard Feuz and his son were our guides. Leaving the rails a little east of the Pass

station, we climbed the well-made trail to the cabin which the railway company has built for the convenience of moutnaineers, thereby earning their heartfelt gratitude. We reached the cabin about nine p.m., with plenty of daylight left to boil the kettle and get comfortably fixed for the night.

At three o'clock Feuz gave the word to rise. A moment's struggle to realize where we were, and here at last was the great day. What mountaineer ever forgets that moment when he first opens the flap of his tent or the door of his hut and draws the breath of the mountain air, with the silence of the eternal hills about him? After a bite to eat, we struck off to the right, circling giant rocks and leaping small torrents, walking rapidly in the uncertain light. It was light when we reached the glacier, and clear enough to take photos when we reached the névé. The southern face, the broadside of Hermit, was directly before us. There appeared to be several feasible routes to the summit. The left or western side of the mountain rose in a sharp angle from the glacier; the eastern side was a long arête of easy grade and apparently afforded a sure, if long, route to the peak. Mr. Wheeler has included in his splendid set of maps—the second volume of his great work on the Selkirks—a fine drawing of Mts. Rogers and Hermit, and has in it marked our route on Hermit as lying along this eastern arête. That is the obvious route, and Mr. Wheeler is in no way to blame for the mistake. Feuz chose another and far more interesting mode of attack. A narrow and steep couloir leads up the face of the mountain from the névé, from which it is separated by a bergschrund. We put on the rope, crossed the cleft by a bridge at the right, worked across to the centre of the couloir, and at once commenced its steep ascent. This was a fine climb on good, stiff snow, and, though at the top somewhat alarmingly steep, was sure and safe.

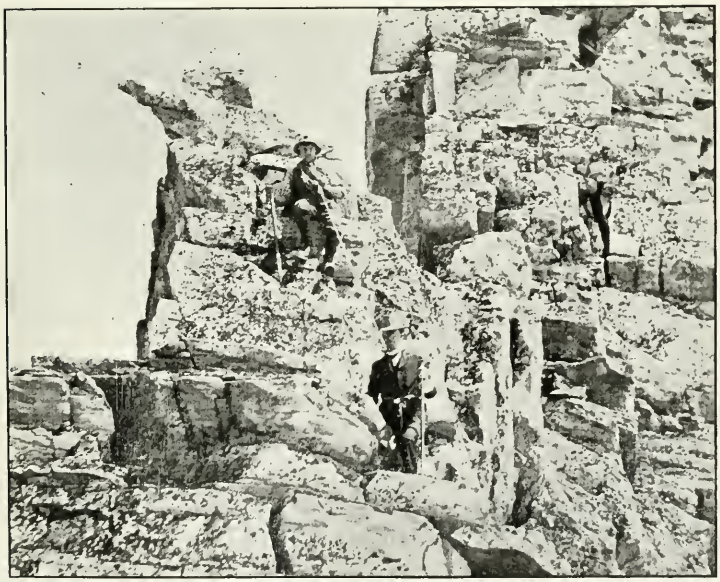
The couloir led us almost directly to the shoulder of the eastern arête, at no great distance beneath the peak itself, to which, however, all progress seemed barred by a precipitous wall of rock. We had breakfast at this point—nine o'clock—and had leisure to look back on one of the noblest and grandest panoramas it is given man to see. The great peaks of the Summit range, from Tupper on the right to our nearest neighbor, Rogers, on the left, with Macdonald, Sir Donald, Dawson and Bonney in the centre, were clad in the soft pink light of the rising sun. From the side of Mt. Hector I have seen this light covering that beautiful ice-mountain, Balfour, and resting on that terrible display of rock and ice—that tortured world of barren crags, which one views from Lefroy; but these scenes lacked something of the mystery of distance and contrast of color and coutour which took one's breath away on Hermit. Truly, Hermit is the mountain for the view which no man can describe,—or forget. Turning about, we witnessed another spectacle, only less impressive. The Rockies lay that way, a solid wall of vast and unexplored grandeur, above which hung a rich canopy of cloud fired from the east.

Feuz did a little reconnoitering here, to find a way round the precipice above us. He found it on the north face of the mountain, and we were soon at work with the axes on the snow. This difficulty being surmounted with comparative ease, there remained only a rock-stairway to be climbed to reach the peak. This was grand work, enlivened by long reaches and undignified pushes from below. An ice-axe would be shoved into a cleft above to yield a foothold for the first man. The rope from above solved the problem for the rest. After an hour or less of this fine exercise, we reached the summit, on the run. There was no cairn, and, as no record of a previous ascent is extant, we were likely the first to gain the top of Hermit.

This first peak (10,194 feet) ran down again into a depression of 100 feet or so, and then up again into a second peak, the second peak again into a third and fourth. We visited each in turn and found them good climbing. The descent from the third peak was quite precipitous, and was quite the hardest piece of work we had yet encountered.

After a good rest on the fourth or most westerly peak, we commenced the descent by the western arête. It was a matter of working from ledge to ledge. Except when one looked from the extreme edge of these ledges, he could see nothing below but the white of the glacier; but a little traverse, north or south, invariably led to an opening to a lower ledge. Falling stones were the worst danger. Feuz ducked in time to escape one half as big as his head. I got one on the ankle, but not to amount to anything. The ledges became narrower and the pitch steeper, the farther we descended. Probably, we covered more than half the distance to the glacier in this way, and might have made the whole descent by the arête, but for a moment of indecision for which I take all the blame. Dr. Herdman and Mr. Gordon had been on the rope with Feuz, and the younger guide and I were roped together. Young Feuz was leading and doing it with accuracy and speed. All went well until we dropped down five or six feet to a sloping ledge covered with scree, and nothing in sight below but the glistening white of the glacier. Carefully he picked his way to the edge and then swung himself sideways to a projection or ledge hidden from us. Here I asked Feuz senior to give me a rope from behind. There was a little hesitation. Mr. Gordon, intrepid climber as he proved himself on this and another climb we had together, wanted to take my place. But the cautious senior guide thought otherwise, and called us back. We all roped together then, and left the arête for good.

CROSSING SWISS NÉVÉ TO REACH MOUNT HERMIT



DESCENDING MOUNT HERMIT

Making a long traverse of the southern face on a wide and easy ledge, we came at length to a wider and less steep couloir than the one which we had ascended in the morning. We glissaded this to the bottom, lying prone and shooting down at tobaggan speed, pulling up with the axes before reaching the bergschrund. Feuz tested the bridge and then shot over it safely on his back. We followed, and the glacier was reached.

This ended the interesting part of the climb. Dr. Herdman, never weary, wanted to climb Swiss peak and make a red-letter day of it, but, as this would have meant getting back to Glacier House at midnight, nobody seconded the motion. All that sticks in the memory concerning the return to the cabin was the intolerable glare of the sunlight on the glacier and the wearisome ploughing through the soft, wet snow. We reached the cabin at four p.m., and after a meal, started down the path to the railway and footed the ties five miles to Glacier House, reaching the hotel at seven o'clock.

Hermit is well worth climbing—Mr. Gordon and I climbed Lefroy, a week later, with Hans Kauffmann, and were amply rewarded, but the long, steady pull up that interminable snow and ice incline is not to be compared, from the climber's point of view, to the varied and exciting work on snow and rock which one meets with on Hermit; and, while the view from Lefroy is one of awe-inspiring grandeur, it does not compare in richness and variety of form and color with the view from Hermit. This, of course, is a matter of taste, but I think my companions will share my view.

THE FIRST ASCENT OF THE CENTRAL PEAK OF MT. BAGHEERA

By W. S. Jackson

To most men, who have done somewhat more than the ordinary show-peak climbing, who have got beyond the educational drudgery of the art, and grown enthusiastic for the most delightful of all forms of outdoor exercise, there comes the desire of conquering a virgin peak. A vague idea at first, then a shadowy possibility, it soon becomes a positive yearning to stand where no human foot has stood before, scale at least one soaring point free from cairns and luncheon cans, before axe and rope are laid by for ever. In the Alps there are none such left to conquer, though there is at least one whereon, though sometimes climbed, the foot of man has never stood. The mountaineer thirsting for fame is reduced to forcing new paths by forbidden routes up or down the oft-climbed peaks. Or else he must seek more distant fields; the Caucasus, the Himalayas, or the Rockies. Some such thoughts as these passed through my brain, as, after leaving Calgary in the early summer of 1905, the mighty barrier of mountains unfolded itself stretching north and south into vanishing distance. But nearer investigation brought disappointment. Everything seemed to have been done already. To find a decent virgin peak, it would be necessary to hire some sort of an outfit—ponies, tents, and drivers. It did not sound comfortable, and it did sound expensive. It is true that I was shown from the top of Temple one of the Ten Peaks that had perhaps never been ascended; but it was a long snow-

grind, and I wanted a climb. If all mountains were long snow-grinds, there would be few keen mountaineers. It was the same story again at Field. In all the tossed sea of snow that lies around Mt. Stephen, there were no wave crests within easy reach that had not been topped. Hope had sunk very low when I reached Glacier. But here, Mr. Bell-Smith, the climber's friend, pointed out on his relief map two still unconquered summits, Mt. Tupper and the central peak of three-headed Bagheera. My holiday had only a short time to run, and there was Sir Donald still waiting as an absolute necessity. Everyone was talking of the wonders of the newly-discovered Caves of Cheops. That settled it. On the morrow, Edouard Feuz, Jr., and I started for Deutschmann's camp at the caves. We followed the railway and found the trestles across the Illecillewaet very unpleasant. The trail to the caves gave a glimpse into the beauties of the forests of the Selkirks. The cool shadows were delicious after the blazing sunshine on the rails. A family of grouse, tamer than barnyard fowl, squatted resolutely in our path. Leaving the trees, ferns and devil's-club were exchanged for flower carpets of lovely hues. The trail descended to the banks of the Cougar brook, which is crossed several times by convenient ice bridges, the remains of winter snows. We camped for the night at the Caves, where Deutschmann received us most hospitably and showed us some of the wonders of the place, discovered by himself the preceding autumn.

In the morning we made a somewhat tardy start along the bank of the upper Cougar brook, till we neared the foot of Mt. Bagheera. There we made our first mistake. We began by ascending the brush-covered bank lying almost directly under Catamount peak. The going soon began to get boggy, the farther we went, the wetter it became, till we were actually

wading, and my feet were soaked for the rest of the day. Emerging at length from this dismal swamp, we mounted the steep snow-slopes above, heading for the notch that separates Catamount from Bagheera. Midway were found beautiful waves of red snow, varying from pink on the crests to crimson in the troughs. This curious phenomenon is due to the presence of a tiny alga, which also accounts for the green snow elsewhere. Scrambling up the rock-work at the head of these slopes, we bore to the left of the notch till we reached the arête. Henceforth we had nothing but good sound rocks to the finish. Steadily working upwards, the projecting eastern point came into view, and seemed at first to be the promised summit; but climbing to it, the centre peak rose some 200 feet above us, looking quite imposing and Doigt de Dieu-like, as seen edge-wise from below. It had been hot work with the sun on one's back all the way, but Feuz frowned on all suggestions of rest and tobacco, and we again attacked the arête. This was largely composed of blocks of white and black marble, and gave firm and generous holds for hand and foot. We soon stepped over the edge of the little platform that formed our Hochste Spitze, and I stood for the first and probably the last time on a virgin peak (9106 feet). Here we found a little breeze, and sat down to enjoy the magnificent view. Far to the north stretched the endless snow-peaks that the Swiss range hides from the Glacier side. Sir Donald presented the grandest view of himself and his satellites that I was privileged to enjoy. Nearer at hand, across a big gulf, rose the eastern peak, of almost equal height (9096 feet). The air was clear as crystal, though two days later from the top of Sir Donald we could hardly see twenty miles away.

When inner cravings had been satisfied, we built an artistic cairn, took some photographs, and prepared

Photo, W. S. Jackson

E. FEUZ, JR., AT OUR CAIRN ON
MOUNT BAGHEERA

Photo, J. Simpson

ONE OF THE DENIZENS OF
COUGAR VALLEY

to descend. It was now nearly midday. Reflecting on the probable condition of the snow-slopes, we started straight down the southern face of the mountain at right angles to the Cougar valley. It became hot again at once. The holds were sound but generally small, and a projecting inch was often all that could be found. Being pioneers, we came of course on an occasional pitch that threatened to cut us off. But Feuz skilfully turned them all, with the aid of the instinct that developes in the best Swiss guides. At length we came to a rather nasty bit. My feet, stewing in soaking boots, felt raw, the sharp rocks had torn my sodden puttees, and I was almost inclined to welcome Feuz's proposal to make a diagonal cut across a steep, doubtful-looking snow-bank. He anchored himself in the edge of the little bergschrund, and I started gingerly to kick steps in the slope. I have always hated unstable snow, and my hatred was soon justified. After a dozen steps, the surface began to slide and I with it, until the rope tightened and swung me clear underneath Edouard. The breath was almost squeezed out of me, but I hung on to my axe and was soon on the edge of the bergschrund. We cut down this till we got to the rocks below: some more scrambling, a rather rocky glissade, and we were on the banks of the Cougar once more.

The walk back to the railway was weary work for one of us; but at the tank we found Mr. Bridgland and a party of brother officials, and with the kindness of fellow-mountaineers, they entertained us in a way that soon revived our spirits, and it was not till dusk that we took to the ties for the return to Glacier House.

Thus ended a delightful trip and interesting climb, for which I tender my warmest thanks to Edouard Feuz, Jr.; whatever merit there is in the performance, it is wholly due to his care and skill.

THE ASCENT OF MT. MACOUN

By the Rev. J. C. Herdman

Mt. Macoun stands up, like an arched horse's neck, eight or nine miles south from Glacier House, near the summit of the Selkirk range. It is a unique and separate peak, the corner mountain on the southeast of the great Illecillewaet névé, overlooking the Beaver valley, the Prairie hills, the Spillimacheen river, Grizzly creek, and Bald mountain.

The massif was named "Macoun" in 1888 by the Rev. W. S. Green, whose charming book, "Among the Selkirk Glaciers," was published in 1890, in honor of the distinguished Professor, Dominion Naturalist and Botanist, who had spent many summers in the West in the study of science.

In the month of August, 1902, I made the first ascent of this mountain with Edouard Feuz, Sr., one of the most capable of the guides brought out from Switzerland by the Canadian Pacific Railway Company. Not only romantic, but in every way enchanting, was the day's tour. We left the hotel at 5:20 a.m., took the east side of the great glacier, and as we climbed, the mists were suddenly swept out of the valley by the triumphant sunlight. We passed little streams and cascades, and, at 8 o'clock, gained Perley rock, an island of stones surrounded by snow-banks and ice-tongues. In order to reach it we had to cut steps like a staircase up a steep snow-slope. So delightful was the view from this platform of rock, that we spent ten minutes looking at the mountains and the scenery. Around us were Mt. Abbott, Glacier crest,

EDOUARD FEUZ OF INTERLAKEN

THE CRACK SWISS GUIDE OF THE SELKIRKS

Mts. Lookout, Green, Sir Donald, Uto, Eagle, Cougar, and below the séracs of the glacier and many waterfalls. Then we tramped up to the crest of the névé, about 4200 feet above Glacier House, and the Illecillewaet valley was suddenly shut out. Instead, a new panorama, south and west, opened up to our eyes: Mts. Bonney, Fox, Donkin, Selwyn, Purity, Dawson, Fish creek, Glacier circle, and many large white snowfields. We kept to the left of the névé, and had no difficulties with crevasses, but our steps were in basins, formed by the winds whirling the snows around. Then Mt. Macoun rose into view. But the problem was, how to get our feet on the mountain? It was surrounded by a high escarpment of snow, with spaces between the vertical banks and the green ice which clung to the mountain sides. Fortunately, scouting about, we found a tongue running out, in a circuitous manner, which joined another tongue, a little lower in height. It was a very narrow peninsula to traverse, and at the end of it we had to step carefully, but the guide jumped from one strip to the other, plunging his ice-axe into the snow, and I followed; thus we reached the side of the mountain in safety.

Next came a difficulty which I have never seen, before or since, in any mountain range: a crack, three to six feet wide, separated the shoulder we were on from the main mass and the walls looked perpendicular. This sharp cut into the mountain may have been limited, but where we stood, because of the rough boulders, there was no way of getting past, and I imagined for some moments that our climb was completely blocked. But Feuz lighted his pipe and studied the walls carefully. Finally he discerned two small ledges, opposite one another, so he descended several feet, leaped over the chasm and rested his ice-axe in a rift between the rocks. Then he cleverly scaled the face of the wall to where a large stone stood, round

which he lashed the alpine rope, holding me to the ledge after my jump and pulling me up the steep ascent. But he pulled so actively that I felt myself almost cut in two, and yelled to be released. After this crisis, we were on the under side of the summit. All the way along its crest there was a large cornice, and this was the only occasion when the guide spoke warningly. He told me not even to speak, because, in Switzerland, the vibration of a voice sometimes starts a small avalanche; but we soon found that the overhanging cornice was frozen firmly to the crest, instead of being a shifting stretch of snow. Soon we saw a gap and, cutting holes through the ice, reached the summit. No cairn had been erected there, so it was manifest that no foot had ever climbed the peak. We built up a "stone-man" and left the record of our climb in his care. Then I got up on his shoulder and gave a good leap several feet higher than the summit. Afterwards I learned that Macoun was computed from survey stations as four to twelve feet lower than the Club's standard of 10,000 feet above sea-level, but I feel that I attained the height.

We decided to go back another way. The vertical wall faces at the crack were the difficulty; for the ledge on the opposite side being higher, the jump would have to be strenuous. Besides, Swiss guides always like to make different trails. So we dropped down on the west side of the mountain, leaving at 12:45 p.m. Then we attempted three descents, but found them fearfully precipitous. The guide put me to the front, which was the right plan, for if I had slipped he was there to hold me back with the rope. But we found the descents too dangerous and rapid, and were compelled to climb up again and go partially over towards the south end. Here Feuz lighted his pipe once more, and studied the rock face that we had to encounter. Soon he detected some little ledges and a few crevices.

Down we went; never before did I have such a descent. His words to me were reassuring and made me feel a Swiss guide myself. We had to grasp the mountain side two or three times with knees and arms outstretched, as there was no hold for boots and fingers. A little stone struck the guide, breaking the pipe which he had fastened to his vest, while I took calmly some cuts and bruises. The vertical descent soon widened out, and at the southwest end of the mountain, a wide sweep of snow took us clear over to the Illecillewaet névé.

We walked nearly in the centre of the snow-field for some miles, and had to rope up again, getting among complicated crevasses. Then we had a good glissade down to Perley rock and reached Glacier House a few minutes after six o'clock. No one, I understand, has ever scaled this peak since our ascent, but it should be tried again, as the delight of the scenery is unsurpassed. In fact, from the summit of Macoun, I discerned rivers running north, south, east and west: the Beaver, the Duncan, the Spillimacheen, and Fish creek.

THE CLIMB OF CROW'S NEST MOUNTAIN

By P. D. McTavish

The discoverer of Crow's Nest* pass is Mr. Michael Phillips, now of Elko, B.C. In the early sixties he came as a Hudson's Bay Company's employee to Fort Sheppard, and subsequently went to Wild Horse, near the present town of Fort Steele, when that place was in the midst of its gold excitement. In the latter sixties he spent his time trapping along Morrisey and Michel creeks, and it was while thus employed that he discovered the pass. Standing at its summit, he looked out across the quiet, forest-clad valley, which lay so calmly beneath him, the whole presenting the appearance of a great basin. Mr. Phillips thought it resembled a huge crow's nest, and in speaking of the pass thereafter, he referred to it as the "Crow's Nest" pass. It is quite natural that the mountain of striking appearance that stood near by should receive the same name.

Like the sacred Fuji Yama of Japan, Crow's Nest mountain rises abruptly out of the earth, with no other mountains within miles. In fact, so striking is this that the Peigan Indians had a beautiful legend as to its origin. According to this legend, the Great Spirit, with his daughter, the Spirit of Water, was walking near where the mountain now stands, when the Spirit of Fire saw them, and at once became enamored of the fair maiden and determined to capture her. But the Great Spirit divined his intention, and caused the fair Spirit of Water to descend into the bowels of the earth. Thus eluded and disappointed, the Spirit of Fire be-

* Now written "Crowsnest" by a ruling of the Geographic Board of Canada.

Photo, H. W. Dubois, Philadelphia *Copyright, 1903*

MOUNT ASSINIBOINE

CROW'S NEST MOUNTAIN

came enraged, descended after the maiden, and in his fury caused such terrible internal havoc that the Great Spirit commanded him to come forth out of the earth. In obedience to the command, the Spirit of Fire came forth, raising his head and shoulders above the earth, thus forming the mountain. "Now stand thou there forever," commanded the Great Spirit. The fair Spirit of Water then descended into the earth and subdued the flames caused by the enraged Spirit of Fire. Since when all has been peaceful. This beautiful legend serves to prove to us that even the aborigines of our country recognized the singular, isolated appearance of this grand old mountain. The gentle forest-clad slopes lead up on all sides to the timber line, at an altitude of about 7000 feet, and from here a perpendicular band about 500 feet in height encircles the entire mountain, after which there is a succession of steep, rocky slopes and perpendicular faces until it finally terminates in a huge symmetrical dome. From the Crow's Nest branch of the Canadian Pacific railway, the mountain looks truly majestic, and often I had cast longing eyes upon it, wondering if it were possible for amateurs to successfully make the ascent. True, Mr. Tom Wilson, the well-known mountaineer of Banff, accompanied by two Swiss guides, had reached the top; but the difficulties they had encountered did not tend much to encourage the novice. My friend, Mr. Keith Whimster, and I talked the matter over, and it was finally arranged that we should make the attempt. Mr. George Harrower of Lethbridge and Mr. L. Stauffer of Frank made up the remainder of the party.

On August 19th, 1905, we met at Coleman, the Canadian Pacific railway station nearest the mountain, and all necessary arrangements were made for the climb on the morrow. At two o'clock a.m. we were aroused from our peaceful slumbers. There was

hurried and muffled tramping of big boots along the hallways, and finally an attack upon the dining-room, where a breakfast awaited us. When we had eaten to repletion (we had a long day ahead of us), we adjusted our packs, and by three o'clock were in our saddles and off.

It was a glorious night, with moon and stars shining brightly. As we galloped along the Old Man river, now skirting a hill with the stream far below, now rushing along by its margin, now plunging into the darkness of a dense copse of timber, or halting to splash through a little rippling brook, it was truly grand. After going five miles west, we turned due north and bore directly upon the object of our attack, which could just be discerned through the dim light of earliest dawn. How defiantly it seemed to smile, towering some 6000 feet above us, and how we wondered what the day would bring forth. Would we really reach the top, or was inglorious defeat, with its attendant chaffing from our incredulous friends, awaiting us? On our right the Livingstone range rose to a height of 8000 to 9000 feet, and when the first rays of the rising sun peeped timidly over its serrated summit, mingling with the silvery light of the waning moon, the transition from night to day was beautiful. We enjoyed some fine effects in white and black; each clump of trees and valley appearing perfectly black, whilst the dim light of dawn revealed the whiteness of the surrounding snow-capped mountains.

The ride along the winding trail was most enjoyable, and led us finally to a deserted lumber camp, beautifully located in a little glade. It was now 4:30 o'clock, and from this close range, looking through the tree tops, Crow's Nest mountain appeared really grand, but alarmingly defiant. We dismounted, tethered our horses, relieved ourselves of every pound of superfluous dunnage, arranged our packs firmly and comfortably,

Photo, Prest Co.

A GENDARME ON CROW'S NEST MOUNTAIN

and at five o'clock started off into the woods by a path which led towards the mountain. After about two miles' travelling we left the path and blazed a trail of our own, which necessarily hampered our speed, so that it was after eight o'clock before we emerged above the timber line. A long slope of loose rock led up to a perpendicular wall several hundred feet high, and as we looked at it, we decided that we had met our Waterloo: Realizing the impossibility of making an ascent here (on the west side of the mountain), we travelled about a mile to the left, during which time we gradually worked to the top of the sloping stretch of loose rock. This brought us to the northwest corner, where a very interesting needle of rock engaged our attention for a short time. On our left was a bare, steep face of rock some 400 feet high, that led up to a crevice, which in turn led to the top of the face. This seemed our only possible chance of getting up, and we believed that once this face had been negotiated, the rest of the climb would be compaartively easy. The climbing was very difficult, but extremely interesting. When we had reached a point about 300 feet high, we found it impossible to proceed further, as the rock arched outwards, baffling all attempts at ascent. We then led off some 40 feet to the left along a very narrow ledge of rock, in the forlorn hope of finding a way up to the coveted crevice, but this ledge terminated abruptly, and we found ourselves gazing into a sort of semi-circular amphitheatre some 500 feet in depth. Not caring to risk climbing over such a place as this, we were reluctantly forced to the conclusion that we must retreat, and so the descent began. This climb, however, was extremely interesting, and we found our rope a very useful part of our equipment.

Near where we descended, was a great crevice, leading up about 400 feet, and resembling the space left in a whole cheese when a thin wedge-like piece has

been removed. We grasped at this as a sort of last straw, entered it, and began a scrutinizing examination of the walls on either side. At length we detected a small ledge which led up a short way to a little dome of rock, beyond which we could not see. But we had hopes, and indulging temporarily in the pleasures of hope, we contented ourselves for a sufficient length of time to dispose of a few sandwiches, which, needless to say, we enjoyed immensely, as it was now nearing ten o'clock, and we had breakfasted shortly after two. The recollection of that lunch always provokes a smile. We sat in a row, on a ledge of cold, damp rock, a dejected quartette, with our feet dangling over a perpendicular drop, beneath which was a small glacier; the water dripped about us and pebbles of various sizes hurled themselves from the heights above; a cold, chilling wind whistled up through the sunless canyon as we sat shivering there; while we were still feeling chagrined over our recent defeat. It was a disconsolate meal, but in memory lives as a most pleasant and amusing incident.

Having temporarily satisfied the cravings of the inner man, who, by the way, demands considerable attention when one is mountain climbing, we eagerly proceeded upwards to ascertain what awaited us beyond that obtruding dome. With some difficulty we surmounted this, and found ourselves at the base of a beautifully straight, but very perpendicular, chimney, about six feet in width and two hundred feet high. This offered possibilities, so we immediately proceeded to climb to its top. Arriving there, a short shaly slope led to a similar chimney, up which we climbed. We now found ourselves at the top of that first circular band which begirts the mountain, and felt that victory was within our grasp. For some time we encountered a series of steep, rocky slopes and perpendicular faces, which led to a long slope of about 1000 feet, after

CLIMBING PRECIPICES ON CROW'S NEST MOUNTAIN

which the climbing again became fairly difficult, but for only a short time, as we had reached the final dome, and at 12:15 o'clock we stood upon the summit, a most jubilant party. Here we found the cairn of rock left by Mr. Wilson's party, but being very amateurish, we failed to examine the glass jar in its centre, which Mr. Wilson subsequently informed me was there, and which contained the names of the former party. The remnants of an old flag we captured as our lawful booty, and carried off as a souvenir, leaving in its stead a new one, floating upon the cairn of rock which we erected beside the other.

We then sat down to enjoy the magnificence of the panorama stretching before us in all directions. Standing isolated in the midst of a beautiful valley, many miles from any other mountain, the view from Crow's Nest mountain is truly grand. At our feet lay the town of Coleman, whose houses seemed mere packing-boxes, while the emerald hues of Crow's Nest lake sparkled resplendently in the sunlight. To the east was the stately Livingstone range, and through its gaps the prairie, vast and illimitable, stretched away as far as the eye could see. To the south, the "Big Chief," a bold peak standing near the International Boundary line, could be seen, while westward rose majestically th triple peaks near Fernie, known as the Sphynxes, but more commonly called the Three Sisters. The snow-capped peaks and glaciers to the north looked most resplendent, and seemed to continue on and on until finally they merged with sky and beautiful cumulus clouds into one glorious and indescribable blending of beauty. The sun shone brightly and the day was calm and still, with no sound whatever to bespeak the presence of any living thing, and as we sat there silently enjoying the grandeur of it all, even a whisper seemed a sacrilegious disturbance of the utter silence that was everywhere about us. At last

it was time to go, as we had many miles to travel through the woods, and darkness is not slow in settling there. So after taking many pictures, we gave one last look at the magnificent surroundings, and the descent was commenced. It was now 14 o'clock, just twelve hours from the time our dreams had been disturbed. We reached the old camp at 17:30 o'clock, had a light lunch, saddled our horses, and rode home through the calm of the summer evening's twilight. Arriving there about 20:30 o'clock, we found that our cairn had been espied by means of a telescope, so that even those of our acquaintances, who smiled incredulously at our attempting the ascent, were forced, though not reluctantly, to forego the pleasure of friendly banter, which we feared when starting in the morning. To any desiring a pleasant trip and a delightful, interesting and remunerative climb, I can heartily recommend the ascent of Crow's Nest mountain.

THE ASCENTS OF MTS. MARPOLE AND AMGADAMO

By the Revs. A. M. Gordon, Alex. Dunn and A. O. McRae.

The last day of the camp was its climax. Some of the members had left toward the end of the week, others departed on Monday. But three of us remained to climb Mt. Marpole—Dr. A. O. McRae, Rev. Alex. Dunn, and Rev. A. M. Gordon.

We were richly rewarded. True, we had to rise at the unearthly hour of 3:45 in the morning, but even this had its compensations. After early breakfast, Dunn and Gordon set out from camp at five o'clock, in company of the guides, Edouard and Gottfried Feuz. Soon we were joined by Dr. McRae, and the party of five began to ascend the valley toward the mountain. It was weary work following the bed of the stream and then trekking up a long slope of slippery shale to the place where the actual climbing began. But, once we had to pick footholds and often handholds carefully, there was no more fatigue. Mt. Marpole is lower than the Vice-President, but gives more opportunity for actual climbing. Here we saw the real thing. First, the guides took us to the top of the unnamed mountain east of Mt. McMullen, and on its summit they built a cairn or "stone-man," to show that we had made the first ascent. Then they led us along the rocky ridge or arête, traversing the mountain from west to east. There were ascents and descents which no one but an expert or a fool would

attempt alone. Thanks to the guides, however, these were made without difficulty.

At one point we had to cross a glacier between two peaks. The usual method would be for the foremost guide to cut steps, for the others on the rope to follow, steadying themselves with their ice-axes. But this takes time; so our guides clambered up the snow cornice at the edge of the glacier, and passed over to see how the snow lay. The guides decided to risk it; we crossed on the cornice; and breathed freely when we stood on solid rock again.

The only actual mishap was the loss of his hat by one member of the party. The breeze carried it gaily into the valley a couple of thousand feet below; even for this mishap the guides were prepared, Gottfried promptly produced from his rucksack a cloth cap, and the climber exchanged the hat of the cleric for that of the mountaineer. So on we went, over rock and glacier, until we came to a rock which would defy even a mountain goat. The upward slope of thirty or forty feet was steep, the ledges were all turned the wrong way. It looked as if nothing but a fly or a limpet could hold on. But in some wonderful fashion Gottfried made his way up, taking the rope with him, and then by means of the rope he pulled us up one by one. A few minutes more of easy work brought us to the summit. So far as we knew, we were the first to stand there. A second "stone-man" was erected to mark this event. It was now half-past two o'clock. All along we had had brilliant sunshine. After enjoying the superb view for three-quarters of an hour, we began the descent towards the glacier lying between Mt. Marpole and The President. From time to time Edouard would reconnoitre: standing on the edges of a cliff overhanging space, he picked out the route, and we got down as easily and safely as if we had been walking on prairie. Then came a walk over a snow-

covered glacier and a delightful descent, with opportunity for "glissading." This part of the journey was made in quick time, as the weather had changed.

Sometimes on the mountains, one has the experience of standing in sunshine and looking down on a thunderstorm below. We were in the midst of the thunderstorm. Nowhere is the lightning so vivid or the reverberation of the thunder so stunning as among the hills. It is a fine experience to go through such a thunderstorm, but one not far from danger. The polished steel handles of the ice-axes attract the lightning. In this way several men in Switzerland have been killed. Our guides did not linger on the heights. They took no chances. They pushed down into the valley with all speed, pausing only to test the snow-bridges spanning the crevasses on the glacier. We reached the valley free from all harm. The one drawback was, that the hail and rain deluged us from head to foot. Yet this was a trifle, and we could look forward to a roaring fire, dry tents, dry clothes, and a good supper on our return. And that is a very different thing from returning to cold grub, wet blankets, no tents, and no fire. Finally, we came to the Upper Yoho trail, and we trudged along, a weird-loking, bedraggled company, rather tired, very hungry, and altogether happy. The arrival in camp at eight o'clock was all that we looked for, and an hour and a half later we were sleeping the sleep of the just. No more exhilarating or healthful day's sport could be imagined. We cannot speak too highly of the skill and care shown by our two young guides. Without them the expedition would have been impossible. Owing to them it was an unqualified success.

MT. STEPHEN

By the Rev. Geo. R. B. Kinney.

It was in October of 1904, about the twenty-first, I left Field at eight o'clock in the morning, for a solitary stroll to the fossil bed on Mt. Stephen. A dense cold fog filled the valley, and promised good opportunities for cloud pictures later in the day. So, besides my lunch, prospector's pick and chisels, I took two cameras, a tripod, plates and holders. For an hour the trail to the fossil bed was followed; now going through the fragrant groves of spruce and fir over their thick carpets of moss, now crossing the noisy, foaming stream on a rustic bridge, but ever up, and always plunging through the heavy clouds of mist. As timber limit was neared, the clouds became broken with many a rift; and then, finally, I emerged above them into the glorious sunshine of a serene day. At my feet lay a sea of hurrying clouds, dazzling white in the brilliant sunshine of that October morning. Its massive swirling billows broke in silence on a soundless shore, and swept in gentle surges over the fossil bed, where once rolled the mighty ocean. Field with its tourists and its noisy, puffing traffic, was no more; it lay fathoms deep in that fleecy, fluffy flood.

On the right, across a few miles of clouds, Mt. Field arose abruptly, its snows glistening pure and white in the sun, with Mt. Wapta just peeping over its broad shoulders. Immediately opposite, Mt. Burgess reared its rugged crest. Between lay that most beautiful of passes, Burgess pass. This trinity of gems seemed an island in the midst of a matrix of down. Across another inlet of this sea of clouds, the ivory peaks of the

Van Horne range and Ottertail mountains formed a gleaming row of fangs, guarding the approaches to the mainland beyond.

After taking a few pictures, the rest of the beautiful morning, from ten o'clock, was spent in gathering fossils and studying that old sea bed. With hammer and chisel, I opened Nature's book, and there, page after page, were trilobites of rarest form. Thousands, yea, millions of years ago, those shell fish had crawled slowly along the old sea bottom. Time had heaped a mountain upon them, had raised their ocean floor to a lofty plateau of a mighty continent, had hardened their mud to slate, and their shells to stone. About one o'clock, having eaten my lunch, the desire seized me to take a few views from the peak of Mt. Stephen. So, depositing the trilobites at the gnarled roots of an old dwarfed fir, and shouldering the load of cameras, etc., I set out for the summit. It only took a few minutes to climb to the top of the spur immediately above the fossil bed and to get above the last of the struggling timber growth, when there burst into view a scene that beggars description: Cathedral mountain, its perpendicular heights searching the very heavens, formed one unbroken wall of a vast amphitheatre. There, ridge on ridge, tier on tier, the parallel ledges, cushioned with snow, rose in countless numbers for thousands of feet. In such places as these the spirits of the mountain sit and watch the changing scenes of the hills in the vast arena before them. Sometimes it is a procession of sheep, or goats, or deer, or bear, or the eagle gracefully sailing. Sometimes it is the frisking mountain rat, or the whistling marmot, or the busy haymaker curing his crops of hay on the hot rocks of the slide. Or again it is the grand orchestra of the hills, breaking forth in the roar of the avalanche, the scream of the wind, the fall of the cataract, or the crumbling of the peaks.

For a mile or more it was easy going over a gentle slope covered with rocks and snow. The clouds had gradually broken up before the genial warmth of the sun, and the Kicking-Horse river seemed a little thread of silver that wound, with countless twists and turns, in a level valley below. Field, with its roundhouse and trains and big hotel, seemed but a little dot, and when an engine whistled, a thousand echoes tossed the sound from side to side, from peak to peak, from canyon to canyon, until it was lost in immensity.

The climb was uneventful up to the time the cliffs near the top were reached. It had been a fairly easy slope all the way. The snow began at timber line, and was hard enough to walk on its top. Mt. Dennis was slowly left behind and sank to a mere hillock beneath. Mts. Field and Burgess gradually slipped down until Wapta and then the Vice-President, with an emerald glacier in its lap, came in full view from behind.

By making a detour, I could have found an easier way, but, having no guide and never having been there before, I began to climb the wall of rock immediately in front. It was a most difficult climb. The short day was nearly ended, the warmth of the sun had given place to a raw, cold wind, and my pack being large and heavy, got in the way. Nearing the top of this almost vertical cliff, my numb fingers slipped and I barely escaped a sheer fall of fully one hundred feet. Surmounting the cliff, it proved but a vanguard of many. Height on height of barefaced cliffs offered their resistance in succession, each crowned with snow-covered ledges. Gradually, however, they were vanquished, one by one, and at last I stood on the glory-crowned summit, ten thousand five hundred feet above the sea.

Mts. Field, Burgess and Wapta lay far beneath. President and Vice-President gleamed and glistened in the near distance. Cathedral mountain, close by,

Photo, Mary M. Vaux

MOUNT STEPHEN FROM THE NATURAL BRIDGE

seemed almost on a level. Here, there, everywhere, some in groups, others in serried ranks, were massed the war-scarred veterans of an innumerable host—the rugged remnants of a vast ancient plateau, stretching north, southeast and west, as far as the eye could see. All this vast array of snow-clad peaks, frowning precipices, glistening glaciers, and yawning gulfs, was burnished with the glowing hues of the setting sun. I watched him sink behind the distant fringe of peaks in the west, and when he was gone, how lonely and chill those somber old masses seemed. I shouted aloud, but my voice was immediately swallowed up in that awful stillness, for there was nothing to give it an echo.

I did not stay long on the summit, for the raw, cold winds that had frozen the snow in crystals several inches long chilled one to the bone. The darkness of night began to swallow up the distant hills, and it was necessary to get down the cliffs while there was still light to see the way. I had gone but a short distance when, following a ledge around more to the south, I made a grand discovery. There, filling a steep, rugged ravine that seemed to extend all the way to Cathedral mountain, was a smooth pathway of snow, steep as the roof of a house. One question flashed to my mind: would it be frozen too hard? I cautiously tried it. Yes! it was hard, but with care it could be travelled. By launching out freely and letting the whole weight come down on each foot at a time, the heels could be forced a couple of inches into the solid snow. Here, indeed, was the best kind of speedy going: swing out one foot, spring from the other, and land on the heel in an inch or two of snow. Each stride covered a distance of several feet, and it was possible to run down that steep precipice of snow as fast as I liked, but my life depended on each heel getting that little two inches of a hold; one slip would mean a fearful slide to death. There was no danger of crevasses, for it was all new snow.

In an amazingly short time a descent of hundreds of feet had been made, until, finally, the bottom of the cliffs were reached. Then I started across and down that long, tedious slope of snow and boulders. The weary slope at last was ended, and I reached the rock-work, where someone had been prospecting for copper just above the fossil bed. Here I carefully felt the way down in the darkness, guided only by the light of the half-obscured stars, found my fossils and rejoiced because home was near. The lights of Field twinkled far below.

With a load of fifty pounds or more in weight, weary, hungry, and thirsty, I found the trail at the foot of the fossil bed, when the going was easier. Then, at last, I came to the brook, and drank deeply of its cold, sparkling waters. On again through the midnight darkness of the woods, where the air was warm and balmy, until the welcome lights of Field came into view. I arrived safely at eight p.m., having enjoyed in twelve hours that which will take more than a long lifetime to forget.

EDITORIAL NOTE.

So far as we are aware only four climbs, other than Mr. Kinney's, have been made of Mt. Stephen without the aid of Swiss guides, viz.: the two ascents, by the Government Topographer, J. J. McArthur and his assistant, T. Riley, in 1887 and 1892; an ascent by Abbot, Fay, Field and Thompson in 1895; and an ascent by A. O. Wheeler's party in 1904. Never before or since has the climb been made by one man alone, and at a time of the year when the conditions are such as to be almost prohibitive. For this reason, if no other, the feat is remarkable.

The mountain has now become the stock climb from Mt. Stephen House, the Canadian Pacific Railway Company's tourist hotel at Field, B.C. When making it, one, and often two Swiss guides are employed. The magnificent view from the summit more than repays the exertions of the climb.

GLOSSARY OF MOUNTAINEERING TERMS

Their Meanings as Used in Literature Relating to the Alpine Tracts of Canada.

Compiled by Arthur O. Wheeler

Aiguille—A needle-like rock-tower or pinnacle, isolated from a central mass.

Alpenstock—A long stout staff, shod with a sharp steel point, used by mountaineers.

Alps, Alplands—The open grasslands, meadows or slopes above timber-line; usually clad wtih heath, heather and beautiful mountain wild-flowers.

Amphitheatre—A natural circular area, surrounded by rising ground, usually rock or snow masses.

Arête—The sharp ridge, edge or rocky spur of a mountain; used in connection with snow as well as rock.

Avalanche—Falling bodies of snow or ice, loosened from their hold by the heat of the sun.

Berg—The integral rock mass rising above a snow-field; also, in the absence of snow, above the slopes of debris, or the alplands at its base.

Bergschrund—The crevasse formed between the edge of a body of snow and a rock berg; one of the chief difficulties and dangers to be overcome in mountaineering.

Boulder Clay—A stiff, tenacious clay containing boulders of all sizes; found in the moraines of a glacier; corresponds to "till."

Cache—A hiding place; a store of provisions, etc., hidden for future use.

Cirque—A circle of rock peaks.

Col—The crest of a neck or pass between two mountain peaks, usually though not necessarily covered with snow.

Confluent Glacier—One, tributary to a trunk glacier; generally flowing from a greater elevation.

Cornice, Snow Cornice—An overhanging edge of snow at the crest of a mountain peak or ridge, caused by drifting.

Couloir—A steeply ascending gully, gorge or ravine in the side of a mountain or rock peak; generally, though not necessarily, filled with snow.

Crampon—A steel frame, set with sharp spikes, strapped to the boot to facilitate climbing on ice.

Crevasse—A fissure or crack formed in a snow-field or glacier; caused by non-elasticity of the ice when moving down the uneven surface of its rocky bed. Longitudinal crevasses are formed in the direction of the flow; transverse crevasses at right angles to the flow.

Divide—The height of land between two drainage basins. The watershed.

Dry Glacier—The portion of a glacier showing clear ice through melting of the snow covering.

Firn—Accumulated snow while in a granular condition and before it has been consolidated into the ice of a glacier; corresponds to the névé or snow-field forming the source of a glacier.

Forefoot—The part of a dry glacier adjoining the terminal moraine.

Gendarme—Name applied to an isolated rock tower or pinnacle, separated from the mass of which it had originally been a part.

Glacier—The form in which snow falling on the higher parts of a mountian range, above snow-line, finds its way down into the valleys. The ice overflows from a firn or névé.

Glacier Table—A block of stone, a boulder, supported by a column of ice which its shade has preserved from melting; generally seen on a dry glacier.

Glissade—To slide down a steep snow-slope; performed sitting or standing according to the conditions of the snow. An ice-axe or alpenstock is used to steer by.

Grat—An edge or sharp ridge; corresponds to "arête."

Hanging Glacier—An overhanging glacier, formed in a crevice on the cliffs of a mountain side.

Hanging Valley—A tributary valley opening high up on the side of a main valley; often carved out by glacial erosion. It is generally marked by an abrupt step at the mouth, due to the eroding agency having continued its work in the main valley long after it had ceased in the hanging valley.

Height of Land—The watershed between two drainage areas. A crest from which the ground slopes in opposite directions; corresponds to "divide" or "watershed."

Hoodoos—The name given in Western Canada to certain grotesque columns, the products of eroison, left standing on the slopes of mountains and deep gulches.

Ice-Axe, Ice-Pick—A tough wooden staff, about 3 ft. 6 in. long, with an adze-shaped steel head at one end and a sharp spike at the other. Opposite the adze, the head is drawn to a point, sometimes set with teeth. It is used to cut steps in steep ice or snow-slopes.

Ice-Fall—The dry glacier.

Langthal—A long valley. The depression between a moraine and the mountain side, usually filled with snow.

Massif—A central mountain-mass. The dominating part of a range of mountains.

Mittlegrat—A middle edge or ridge, as for instance: the rock-edge between two snow-fields or parts of a glacier.

Moraines—The rock debris transported by a glacier and deposited at its base, along its sides, or between two separate ice-flows. They are respectively named: terminal, lateral, and medial moraines.

Moulin—A nearly vertical shaft or circular cavity worn in the ice of a glacier by a surface rivulet falling into a crevasse, down which it pours in a sub-glacial cascade.

Névé—The accumulated snow forming the source of a glacier; corresponds to "snow-field" or "firn."

Nunatak—A crest or ridge of rock appearing above the surface of an ice-field or glacier.

Reentrant—Rocks are spoken of as being at a reentrant angle, *i.e.*, their faces slope inwards from the perpendicular.

Roche Moutonnées—A group of scattered knobs of rock, rounded and smoothed by glacial action;

so called from their resemblance to a flock of sheep lying down.

Rock-Fall, Rock-Slide—An accumulation of broken rock fallen from the cliffs above, through disintegration of their masses; often of considerable extent.

Rucksack—A bag, especially adapted to the back, for carrying the impedimenta of a mountain climber.

Schrund—A crack or crevasse in the ice of a glacier.

Scree—Loose, broken shale at the foot of a cliff; slopes of debris fallen from above through disintegration.

Séracs—Fantastic pillars of ice formed on a glacier by the intersection of longitudinal and transverse crevasses where the grade of its rock bed is broken by ledges or steps.

Snow-Mushrooms—Accumulation of snow in the woods on trees, stumps, etc., resembling giant fungi of the species named. They are seen of great size and variety along the Canadian Pacific railway through the Selkirks.

Snout—The most advanced part of a dry glacier; corresponds to "forefoot."

Striae, Striation—Grooves, or scratches cut in rocks or boulder clay by the action of ice moving down an incline.

Summit—The highest point of a mountain or peak. The lowest part of a mountain pass. The highest crest of a ridge.

Talus—The mass of rock fragments lying at the base of a mountain cliff, formed by the accumulation

of pieces brought down from above by the action of gravity, frost, rain, etc.; equivalent to "scree" or "debris."

Till—A stiff clay containing boulders of all sizes up to several tons weight; often smoothed and striated by glacial action.

Tongue—The extreme end of a glacier; corresponds to "forefoot" or "snout."

Watershed—The divide between two drainage systems or catchment areas. The height of land between streams flowing in opposite directions.

Scientific Section.

THE MOUNTAIN WILDFLOWERS OF WESTERN CANADA

By Julia W. Henshaw

There is a region in Western Canada where the most exquisite wildflowers in the whole world bloom above the clouds; not singly or in groups, but in beds and banks these blossoms of every hue, and size, and form flourish with a rich luxuriance in the alpine meadows of the Rocky and Selkirk ranges, that recalls those tropical gardens only to be found on the irrigated fringe of the desert. Yet how much more ethereal in texture and coloring are these hardy alpine plants, growing at an altitude of from 3000 to 9000 feet above the level of the sea, than their fellow-flowers which grace the sultry lands of the Orient.

In the Western mountain ranges lies the real Garden of Nature in Canada. It is a wild garden, and wild are its surroundings, a beautiful wilderness of wilding bloom, fragrant with the breath of Heliotropes and Violets, and glorified by the sheen of scarlet Indian Paint-brushes, yellow Arnicas, and purple Phacelias.

Among the mountains there are plants peculiar to each particular locality, though there are also hundreds of species which abound equally in all the various districts. At Banff, in the Rockies, the wildflowers are within the reach of all; for there they grace the low-lying meadows in every direction, are found in the thick forests, and out upon the dry stony slopes of the hillsides. At this spot it is quite unnecessary to climb

in search of them, as is more or less the case at Lake Louise and Glacier, for they seem to cover the whole locality with a richly colored profusion, which rivals the flower-beds in cultivated gardens.

The Banff Hotel stands on the cliff, high above the confluence of the Spray and the Bow rivers; steep banks broken by large rocky prominences sweep down from its wide verandas to the boiling torrents below, and here in sheltered nooks and crannies grow the curiously-branched Coral-roots (*Corallorhiza innata*), while the tendrils of the white and purple Vetches trail over the stones, and the Wild Clematis (*Clematis Columbiana*) winds its leaf-stalks around the branches of adjacent bushes. Lower down you will find huge clumps of the Service-berry (*Amelanchier alnifolia*), an attractive shrub bearing many clusters of snow-white blossoms amid its pale green foliage, and farther on the Fireweeds flare and flash like torches burning in the long grass.

Along the banks of the Bow river stretch flat meadows where conifers grow sparsely, and the pungent scent of pine and balsam fills the air with subtle sweetness. The ground is covered with dry moss and a tangle of short green growths, above which tower tasselled rushes. Here flourish the exquisite white blossoms of the One-flowered Wintergreen (*Moneses uniflora*), which has been so aptly named the "Single Delight," its waxen-petalled cups bent downwards close to the soil, and its delicate fragrance floating forth on the July breeze.

The roads which thread the forests and lead to those hot sulphur springs which gush forth out of the mountain-sides in copious streams, are fringed by the small plant-like shrubs of the Birch-leaved Spiræa (*Spiraea lucida*), crowned in August by big clusters of creamy blossoms faintly tinged with pink, which smell extremely sweet, and are particularly attractive to the

eye of the traveller. Just where the road ends and the trail, which leads to the crest of Sulphur mountain surmounted by the Government Observatory, begins, you will find vast beds of the White Dryas (*Dryas octopetala*) growing in dry soil and exposed to the full glare of the sun, its silver-backed foliage carpeting the earth, and each large white corolla holding up a heart of gold.

Then, should you leave the open road and seek to follow the narrow trail as it winds upward towards the eternal snows, what a wealth of bloom you will encounter on every side. Great orange lilies flaming out from a bank of ferns, the yellow-flecked magenta Calypso (*Calypso borealis*) growing in its solitary beauty from a single bulb with a single leaf at the base of its slender stem, Columbines, Garlics, Monks-hoods, Anemones—there is no end to the floral treasures that spring to life at every step. Or should a happy inspiration seize you to visit the Cave and Basin, where one of the hot sulphur springs has been utilized to supply the magnificent swimming baths, and an ancient geyser, now extinct, has hollowed out a marvelous cave of eccentric formation, you will be rewarded by the sight of quite a different set of plants; for there the warm overflow of the water gushing down the hillside, nourishes wonderful clumps of bright blue Lobelia, huge azure Gentians, Asters, Sunflowers, purple Mints, Butterworts, and sweetest and most fascinating of all, the large showy spikes of the Ladies' Tresses (*Spiranthes Romanzoffiana*), and the pale pink clusters of the Fly-spotted Orchis (*Orchis rotundifolia*).

Banff is by no means the only locality in the Rocky mountains where flowers abound. In the vicinity of Lake Louise the Western Anemone (*Anemone occidentalis*), with its white translucent cups, veined and tinged with purple, covers the higher slopes of the

Photo, Julia W. Henshaw

YELLOW ADDER'S TONGUE
(ERYTHRONIUM GIGANTEUM)

hills, following up the retreating line of the melting snows, in springtime and, later on, decorating the mountains with its fine feathery seed-heads. Here, too, the Wild Heliotrope (*Valeriana sitchensis*) grows in profusion, the pink Swamp Laurel (*Kalmia glauca*) and the White Mountain Rhododendron; Heaths and Heathers, red, rose, and white, carpet the earth beneath the Lyalls Larches, and are among the last vegetation seen at "tree-line"; the Globe Flower (*Trollius laxus*), a great white bloom with a heart of gold, pushes its way up through the icy coverlet of winter, and the Romanzoffia, with its petals of pure velvet, nestles in the crevices of the rocks at an elevation of 8000 feet.

Field is the place where you will find the large Yellow Lady's Slipper (*Cypripedium pubescens*) in all its rare perfection. On a long moraine which stretches up from Emerald lake to the foot of the Yoho valley, these huge orchids grow in thick clumps in the month of July. They are weird, uncanny flowers with big yellow pouches and long spiral petals, and very strange does it seem to find there, flourishing on alpine heights, those plants that we are accustomed to associate with South African jungles and tropical surroundings.

As if in contradistinction to the exotic growth of these giant Orchids, you will also find at Feld the hardy Ox-eye Daisy (*Chrysanthemum Leucanthemum*), the white Canada Violet, the Ragworts, the Honeysuckles, the Cow Parsnips, and the Harebells, rioting all over the meadows, and clothing the earth with a coat of many colors.

At Glacier the Yellow Adders Tongue (*Erythronium giganteum*) is, perhaps, the most attractive plant to travellers. I have seen these pale yellow blossoms, amid their pallid green leaves, glimmer at dusk with a lambent light beneath the shining star-sown fields of heaven, and at dawn have seen the whole mountain-

side break into bloom with exquisite odorous flowers, as if a manntle had been flung about the shoulders of the slopes, while at each step one had perforce to crush them under foot, so closely clustered did they grow among their smooth, spear-like shoots.

To the true lover of nature there is no greater pleasure than to stand where the snow-crowned mountains tower up to heaven, where the thin blue tint of the sky is stretched out over stony bastions, rising above the tall green conifers, and the alpine streams, ice-born in the heart of the sparkling glaciers, form a silvery network enmeshing myriads of bright-hued blossoms which bud and blow at the bidding of the summer sun. Such is the Garden of Nature where the mountain wildflowers of Canada grow

"'Twixt the green and the azure sphere."

When you leave the Châlet Hotel at Lake Louise to follow the trail which leads into the Valley of the Ten Peaks. you begin the long slow ascent that ends on the shoulder of Mt. Temple, from whence you obtain an exquisite view of Moraine lake. Here you enter the wonderful flower-fields of the valley, where blossoms of every hue sweep in great waves of color from "tree-line" down into the depths, 3000 feet below. Here the Indian Paint-brushes (*Castilleia septentrionalis*) and Painted-cups (*Castilleia miniata*) are to be found in all their glory, scarlet, red, pink, white, yellow and orange they abound on every hand. Mingled with them grow golden-silvery Hairy Hawkweeds (*Hieracium Scouleri*), Harebells (*Campanula rotundifolia*), Phacelias (*Phacelia sericea*), cherry-tipped Eriogonums (*Eriogonum umbellatum*), blue-eyed Speedwells (*Veronica alpina*) and a dozen different species of Vetch, Saxifrage and Rock-cress.

An alpine meadow is a spot of supreme beauty, where the Wild Clematis (*Clematis Columbiana*) and Macoun's Gentians (*Gentiana Macounii*) are blue as

Photo, Julia W. Henshaw

GREAT-FLOWERED GAILLARDIA

(GAILLARDIA ARISTATA)

the sky overhead, while the Yellow Columbines (*Aquilegia flavescens*) toss their heads in the passing breeze and a thousand flowers spangle the grass, their star-like faces upturned to meet the smile of the sun. These alpine gardens, held close in the curved arms of the hills, or set like jewels on the bare breast of the stone bastions, are one of the great marvels wrought by Nature in the recesses of the Western mountains, the contrast between the beauty of the blossoms and their barren surroundings being as vivid as it is enchanting.

The Bunch-berry (*Cornus Canadensis*) is a dweller in the dense forests, where its white cruciform flowers and scarlet fruits are familiar to all travellers. So also is the Queen-cup (*Clintonia uniflora*), so named by me in English in 1903, the name being now adopted in the Canadian nomenclature of plants; for queen it certainly is of all the lovely flower-cups which grow in the mountain valleys, its pure white petals forming a chalice fit for the First Lady in our land, and its large pale green leaves constituting a fitting background for so ethereal a bloom.

On the dry sunny flats at an elevation of from 4000 to 5000 feet above the level of the sea, the Giant Sunflowers (*Helianthus giganteus*), Great-flowered Gaillardias (*Gaillardia aristata*), full-fringed Golden-rods (*Solidago Canadensis, S. decumbens*) and Heart-leaf Arnicas (*Arnica cordifolia*) flaunt their gay golden petals; tall and handsome plants they are and very attractive. Close beside them grows the frail little Wild Flax (*Linum Lewisii*), which droops as soon as it is gathered and withers at a touch, the humble Narrow-leaved Puccoon (*Lithospermum angustifolium*), the Yellow Rattle (*Rhinanthus Crists-galli*), Tall Lungwort (*Mertensia paniculata*) and Loco-weed (*Oxytropis Lamberti*), bushes covered with softly-blushing Prickly Roses (*Rosa acicularis*), flanked by

flocks of Pink Everlastings (*Antennaria parvifolia var. rosea*) and warm-scented Clovers (*Trifolium pratense*), realms of rose where the calm of green things growing tempers the lure of the coral and carmine, and the grasses are gossiping as the migrant hosts of the Dandelions march on through Summer's wide-set door, with all their golden banners unfurled to the southern wind.

Close beside the alpine lakes upon whose bosoms float flat lily-pads, and along the margin of those streams where wet-loving water-weeds wind their tendrils about the drooping, dripping willow wands and Blue-eyed Grasses (*Sisyrinchium angustifolium*) twinkle like azure stars in the green firmament of the moss, the pale globular blossoms of the Small Wintergreen (*Pyrola Minor*) hang in pearls upon each juicy stalk and myriads of Red Monkey-flowers (*Mimulus Lewisii*) glimmer like lamps in the gloom of the thickets.

Very early in the Spring the Pasque Flowers (*Anemone Nuttalliana*) appear in the land, their purple cups with silvery linings opening wide long before the fringed fern-like foliage develops about the thick downy stems. Very high up on some tiny plateau held in a hollow amongst the hills, some play-ground of the sun, where a patch of verdure is laid in the earth's brown lap, dew-drenched at dusk, ripened to sapphire by the sun at noon, wind-wrinkled by the gales that blow crisply off the glaciers, these large leaf-whorled Pasque Flowers spread in purpling waves across the waste, and turn the plateau into a paradise of flowers from whose violet rim runs the warm wine of loveliness.

To the traveller the wildflowers of the Rocky and Selkirk mountains are a wonderful revelation of the prodigality and color-painting of Nature in these alpine regions; while to the botanist they are a constant

source of interest and delight. There is no more beautiful, rich or varied alpine flora in the world than that of the British Empire, and it is the proud boast of Canada that within her Western borders grow the choicest specimens of many mountain wildflowers.

EDITORIAL NOTE.

The foregoing article by Julia W. Henshaw, author of "Mountain Wild Flowers of Canada," published by William Briggs, of Toronto (price $2.00), was originally written for the "Standard" of Montreal. It is now republished by permission of that paper, with amplifications, for the information of our members.

No visitor to the Canadian Rockies should come without Mrs. Henshaw's book. Written in a most delightful and artistic manner, it furnishes a text that, while appealing to the layman in the simplicity of its language, does not neglect the scientific aspect of the subject. It is designed with the purpose of enabling the traveller to identify the various species seen and it fulfils its mission well.

GLACIER OBSERVATIONS

By George Vaux, Jr., and William S. Vaux

Of all the phenomena that attract the nature lover in the high mountains, possibly none is more interesting or appeals more strongly to the imagination than the glaciers.

These vast bodies of ice, slowly meandering from the highest peaks and snow-submerged valleys, calling to mind that epoch when the polar ice cap covered the whole of Canada and the northern part of the United States, ever pushing onward with resistless force, give us a picture of the operation and unchangeableness of natural laws, which is most impressive.

Whilst the glaciers of the Canadian Rockies and Selkirks cannot compare in size with those of Alaska and other far northern latitudes, there are probably no other mountain ranges in the world where the conditions are more favorable for glacial study and observations. All the various types may be seen, and their location is such that they may be visited with the greatest ease by the tourist, and a continuation of observations made and records kept, which in the future will be of the greatest value in solving the many problems that are as yet unanswered respecting the action of glaciers. In no way can the Alpine Club of Canada do more to further scientific interests than by taking steps to carry on some work of this sort systematically each year.

Though much of it has already appeared in the Proceedings of the Academy of Natural Sciences of Philadelphia, it seems to be not amiss to give here a brief resumé of the work which we have done on the

glaciers of this region, in the hope that it may prove not only interesting, but also that it may serve as a starting place and prevent duplication of effort. We shall, therefore, run the risk of repeating what is familiar to most of the readers of the Canadian Alpine Journal and, for continuity of treatment, say a word as to the theory of glaciers.

Broadly speaking, a glacier may be said to be a mass of ice of sufficient volume to flow down from an elevation. With the heavy precipitation of snow characteristic of high mountain regions, it is one of the provisions of Nature by which an indefinite accumulation of snow and ice cannot occur.

The Rocky mountain system in southern Canada consists of four principal ranges. Beginning with the west these are: the Coast range, the Gold range, the Selkirk range and the Main or summit range of the Rocky mountains, the two former being much lower. If now one will examine a map of the Pacific ocean upon which the currents are marked, he will see that the great Japan current flows in a northeasterly direction along the Asiatic coast, until it divides, one branch continuing through Behring sea and strait into the Arctic, whilst the other and larger portion takes a great sweep to the east, until it strikes the American continent, when it turns southward, and flows parallel to the coast. Necessarily there is an enormous amount of evaporation from this great valume of warm water and the winds blowing over it are laden with moisture. Their prevailing direction is from west to east. Carrying their burdens of water vapor, they are responsible for the moist and mild climate of the northern portions of the Pacific coast of Northern America. Where these winds meet the cooler land currents of air, some precipitation occurs, but they are not seriously depleted of their moisture until they strike the cold Selkirks, when the precipitation is very heavy. As a result of

this the air current rises and so crosses the mountain range, only to be met beyond by the still colder and loftier Rockies, where most of the balance of the moisture is lost. Herein we see why the western slopes of these mountains have a much heavier rain and snowfall than the eastern slopes and why it is that the great plains stretching from the foothills to the centre of the continent are comparatively so dry.

In the lower levels this precipitation is in the form of rain, during most of the year at least. But when we reach the elevation of the higher mountains it is almost entirely fine granular snow, even in midsummer. On bright days part of this will evaporate, but the greater portion keeps on accumulating, until as the result of the pressure of the superimposed weight of new snowfalls, it gradually becomes compacted into hard solid ice. This ice is like that which forms in our rivers and lakes, except that its internal crystalline structure is different, owing to the different way in which it was formed. Now, if this were the end, the situation in our regions of high mountains would be very different from what it is, for the snow and ice would keep on increasing indefinitely, as the amount of melting at such high levels must be quite small, and conditions analogous to those of the polar regions would ensue. But Nature comes to the rescue. With the increasing pressure caused by the weight of the ice, to which is added the attraction of gravitation, the ice starts to flow; very slowly, but none the less surely. It is hard for us to conceive of so brittle a substance as ice, as we know it, flowing. Yet it does; and doubtless the internal structure of the ice, above referred to, aids in this. But any ice under pressure is more or less plastic. The pressure exerted on these great bodies of ice by the weight above is tremendous, and their onward motion is resistless. Its effects are seen in the way in which ledges of the hardest rock are smoothed off, and often-

times most beautifully polished and grooved by the ploughing over their surfaces of rocks and stones caught in the ice. Possibly the simile frequently used of the way in which thick mortar will run when poured out of a bucket gives as good an idea as any of the manner in which the ice composing a glacier flows. The region of transformation of snow into ice is called the névé.

There is still another and distinct apparent movement of glaciers, which is even more evident than that above described. Naturally when the ice stream reaches the lower and warmer altitudes, melting goes on more rapidly, until finally the end of the ice wastes away, and a stream or river ensues. Now, it is for only a very short time in each year, in the latitude that we are considering, that the temperature is such that the amount of daily melting of ice exactly corresponds with the daily advance produced by the flow of the glacier. Hence it is that we have an oscillation of the tongue, which in winter will gradually extend farther down the valley, whilst in summer it will gradually retreat. This same result of advance and retreat may also be produced by protracted changes of weather conditions as more or less precipitation, higher or lower mean annual temperature. Such must last, however, for terms of years in order to produce anything more than a temporary effect upon the glacier. This characteristic has long been noted, and it is found that usually through long cycles varying from a dozen up to thirty or more years, the glaciers of a given region will show each year a net advance and then again for a succeeding period successive annual recessions. Our Canadian glaciers are no exception to this rule, and during the time they have been observed retreat has been the almost universal movement.

Now, for a brief account of our personal observations on the various glaciers which we have studied:

Illecillewaet Glacier (Glacier House).

Its proximity to the Glacier House and the ease with which it can be reached, has caused this glacier to be more visited and more studied than any other in the whole region. Its size is not such as to cause it to command unusual attention, as there are many others which greatly exceed it. But its location has attracted attention to it ever since the opening of the Canadian Pacific railway, and from 1887 to the present, there have been more or less continuous records made. Our work has consisted:

(*a*) In mapping the end of the glacier, with its several moraines and surroundings, showing their conditions through a number of years.

(*b*) Taking a series of "test photographs" in successive years, from the same position.

(*c*) Measuring the amount of recession from year to year.

(*d*) Measuring the rate of flow.

(*a*) Several maps of the Illecillewaet glacier have been made. We have drawn two, one in 1899, and the other in 1906. Both are from actual surveys and photographs, showing the limits of the ice, the various adjacent moraines, and the rocks marked by various investigators. They may be found in the Proceedings of the Academy of Natural Sciences of Philadelphia.

(*b*) Each year since 1899 we have taken a 6½x8½ photograph from a large boulder, located to the right of the trail, soon after it emerges from the forest. These pictures form a most interesting series, and a comparison of them gives a very accurate idea of the many changes in the ice as they have occurred.

(*c*) Numerous individuals have marked rocks in the bed moraine of this glacier, giving bases from which

Photo, Geo. Vaux, Jr. and Mary M. Vaux

TEST PICTURE OF THE ILLECILLEWAET GLACIER FOR THE YEAR 1905

SHOWING THE LEFT LATERAL MORAINE, MOUNT LOOKOUT IN CENTRE

to calculate the amount of recession. By correspondence and otherwise we have endeavored to collate all of this information, and it is recorded in these maps. The first systematic marking was done in 1888 by the Rev. W. S. Green. He daubed with tar a number of boulders adjacent to the ice, and its limitations that year may be easily made out by following these marked rocks. Our own work has also included the marking of the edge of the ice as it was in 1887 upon a large boulder beside the trail, just as one emerges from the alder bushes. A photograph taken at that time by us, and showing this huge rock imbedded in the ice, gave the basis for the mark. We have also marked several rocks in the bed moraine, and from one of these having on it a circle and cross the measurements have been made since 1900.

The following table gives the results of the observations for recession:

Illecillewaet Glacier, Recession of Tongue of Ice from Rock C.

Date of Observation.	Distance Tongue of Ice to Rock C.	Recession of Ice since previous year,
Aug, 17, 1898.....	60 feet	
July 29, 1899.....	76 "	16 feet
Aug. 6, 1900.....	140 "	64 "
Aug. 5, 1901.....	155 "	15 "
Aug. 26, 1902.....	203 "	48 "
Aug. 25, 1903.....	235 "	32 "
Aug. 14, 1904.....	240½ "	5½ "
July 25, 1905.....	243 "	2½ "
July 24, 1906.....	327 "	84 "

(*d*) The most detailed and probably the most interesting work we have done, however, is the measurement of the rate of flow. Rev. W. S. Green made some observations, but, as he was not equipped with

proper instruments for the work, his results were not very satisfactory. In 1899 our own work of this sort began. A base line was laid out on the right moraine, at a point about 1000 yards above the tongue of the glacier. We had provided a number of square steel plates, painted bright red and lettered for identification. With the assistance of a transit these were laid out across the glacier in a straight line, and at points as nearly equidistant as possible. Some days later, and again in subsequent years, the position to which the ice had carried these plates was measured by trigonometric methods, and then the rate of flow calculated.

As time went on some of the plates were lost through their slipping into crevasses, or from other causes. We have reason to believe, however, that none of them were disturbed by visitors, which is a satisfaction. Finally they had flowed so far down that none of them could be seen from the ends of the base, and in 1906 a new set of plates was laid out. The interval of time at our disposal was too short to permit of any very satisfactory deductions from this new line of plates, apart from obtaining the rate of summer flow, but we are hoping to secure measurements the coming summer, which may add to the amount of knowledge we possess on this subject.

The following tables summarize what has already been done:

Table Showing Motion of Line of Plates, 1899 to 1906.

Number of Plate.	Position of Plates on July 31, 1899.	Distance below original line on August 6, 1900.	Daily Motion 1899 to 1900.	Distance below original line on August 26 1902	Daily Motion 1900 to 1902.	Distance below original line on August 28, 1903.	Daily Motion 1902 to 1903.	Distance below original line on July 12, 1906.
1.....	On line.	1,044 ins.	2.82 ins.	3,455 ins.	3.21 ins.	Lost	——	Lost
2.....	On line.	1,488 ins.	4.00 ins.	4,446 ins.	3.94 ins.	Lost	——	Lost
3.....	On line.	1,716 ins.	4.64 ins.	4,848 ins.	4.18 ins.	6,216 ins.	3.73 ins.	On border moraine 10,200 ins.
4.....	On line.	2,112 ins.	5.71 ins.	Lost	——	Lost	——	
5.....	On line.	2,220 ins.	6.00 ins.	5,850 ins.	4.84 ins.	7,740 ins.	4.87 ins.	Lost
6	On line.	2,280 ins.	6.16 ins.	6,312 ins.	5.51 ins.	8.388 ins.	5.65 ins.	Lost
7	On line.	2,160 ins.	5.84 ins.	6.504 ins.	5.79 ins.	Lost	——	Lost
8.....	On line.	2,040 ins.	5.51 ins.	Lost	——	Lost	——	Lost

Table Comparing Summer Daily Motion of Plates on Illecillewaet Glacier, 1899-1906.

1899 — 36-day interval.			1906 — 12-day interval.		
Number of Plate.	Feet from 1906 ice edge.	Average daily motion in inches.	Average daily motion in inches.	Feet from 1906 ice edge.	Number of Plate.
			Plate lost	92	1
1	187	2.56			
			7.00	276	2
2	415	3.90			
3	520	5.51			
			11.33	532	3
4	668	6.77			
			9.75	727	4
5	730	6.06			
6	900	6.79			
7	956	6.16			
			10.25	1,020	5
			8.85	1,171	6
8	1,220	6.00			

Asulkan Glacier (Glacier House).

Our work here has been on the same lines as on the Illecillewaet, though our observations have not been as continuous, and no map was made and no attempt to measure the rate of flow till 1906.

As respects recession, this glacier has shown more changes than some of the others. In 1901, a distinct advance occurred which lasted for about three years. Then recession again ensued. Our series of observations was somewhat interfered with, because the large boulders in the moraine, which were employed to mark our datum line, were shoved forward by the ice in its advance, entirely obliterating the primary base line for our measurements.

Photo, George Vaux, Jr. and Mary M. Vaux

ICE ARCH IN YOHO GLACIER—SHOWS POINT OF ICE MEASURED TO BY DR. SHERZER FROM ROCK "A"

Table Showing Changes in Tongue of Asulkan Glacier.

Aug. 12, 1899....“ Rock opposite lined with snout.”
Aug. 8, 1900....Snout receded 24 feet.
Aug. 6, 1901....Ice *above* rock 20 feet, 4 feet advance.
Aug. 30, 1903....Ice *below* rock 16 feet, 36 feet advance since 1901.
July 23, 1906....Ice lines with test rocks, or is in same position as in 1899.

The method employed in 1906 to measure the rate of flow was identical with that used on the Illecillewaet. The accompanying table gives the results so far secured.

Table Showing Average Daily Motion of Plates on Asulkan Glacier between July 13 and 23, 1906.

Plate.	Total Motion.	Average Daily Motion.	Remarks.
No. 7.....	24 in.	2.4 in.	Near right edge of ice.
No. 8..	39 "	3.9 "	63 feet from R. edge.
No. 9.....	55½ "	5.5 "	157 feet from R. edge.
No. 10.....	67 "	6.7 "	325 feet from R. edge.
No. 11.....	67 "	6.7 "	415 feet from R. edge.
No. 12.....	63 "	6.3 "	Close to left edge.
Boulder	89 "	8.9 "	On left moraine, resting on ice foot.

*Wapta Glacier (Yoho Valley)**

In 1901, when we first visited this glacier, we marked on the bed rock the extent of the tongue, and also took test photographs from a large boulder high up on the right moraine. This work was repeated in 1904 and in 1906. The work of the Scientific Section of the Alpine Club will demonstrate the rate of flow.

The recession from 1901 till 1904 was 89 feet, an average of about 30 feet per annum. From 1904 till 1906 apparently the glacier was practically stationary.

* Now known as Yoho Glacier.

Victoria Glacier (Lake Louise).

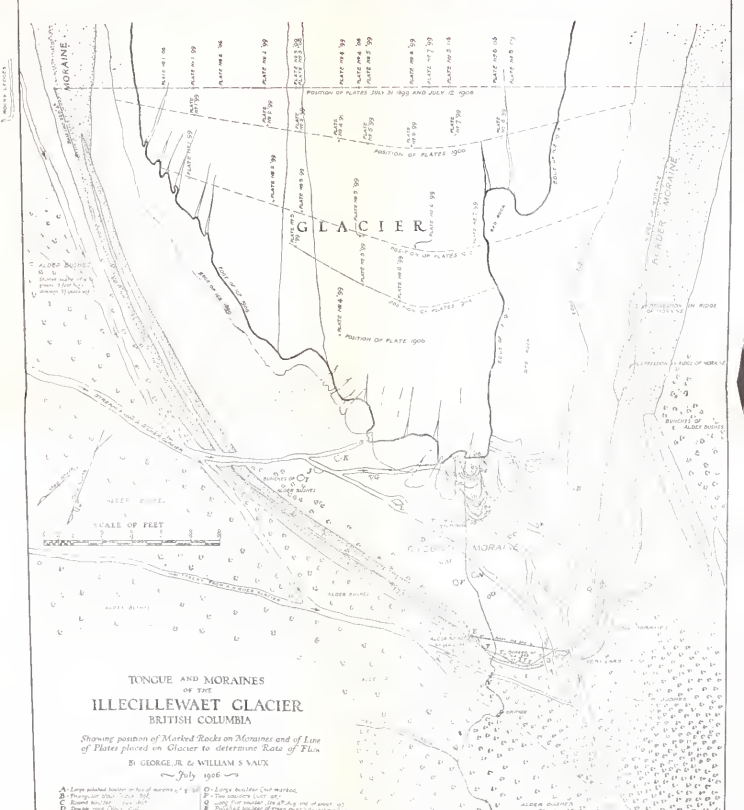
We have made some measurements to show the recession of the Victoria glacier. Its whole lower portion is so deeply buried in morainal material that the tongue is very difficult to distinguish. The motion is also complex, as there is a sideways movement across the main stream caused by the inflow of the Lefroy glacier. The tongue at present appears to be on the left side. Here the recession appears to have been about 17 feet per annum between 1898 and 1903; since then, there has practically been no movement.

We have also endeavored to approximate the rate of flow of this glacier at two different points, one near the forefoot, and the other about two miles further up. These observations were made with the aid of some large boulders, and the prismatic compass, by which means the position of the rocks was located in successive seasons relative to fixed points not on the ice. The amount of the flow was about 147 feet during the year 1899-1900.

We have also visited and photographed a number of other glaciers, but on none of them have we made any accurate measurements and observations. In the interests of science, it is much to be hoped that the number of glaciers studied will be very largely extended. The field is an extensive one and there are many problems to be solved.

TO ACCOMPANY PAPER WRITTEN BY GEORGE VAUX JR AND WILLIAM S VAUX FOR THE CANADIAN ALPINE JOURNAL

SECTION THRO GLACIER AT LINE OF PLATES



TONGUE AND MORAINES
OF THE
ILLECILLEWAET GLACIER
BRITISH COLUMBIA

Showing position of Marked Rocks on Moraines and of Line of Plates placed on Glacier to determine Rate of Flow

By GEORGE JR & WILLIAM S VAUX

July 1906

A-Large polished boulder in top of moraine 4' x 3' 10"
B-Triangular stone 3'6" x 3'6"
C-Round boulder 5'6" x 5'6"
D-Double boulder
E-Large rock in border moraine (Yoho slate)
F-Large angular block (Gt. Glacier)
G-Pyramidal block (Gt. Glacier)
H-Range of 18
I-Large bottom rock (not marked)
J-Large bottom rock (not marked)
K-Large bottom rock (not marked)
L-Large bottom rock (not marked)
M-Small rounded boulder (G.G. slate)
N-Large bottom rock (not marked)
O-Large boulder (not marked)
P-Two boulders (Gt. Gl.)
Q-Boulder 4'6" x 4'6" (Gt. Gl. slate one of about 10)
R-Polished boulder (Gt. Gl. slate) 5'6" x 5'6"
S-Long flat boulder 8' x 3' (Gt. Gl. slate)
T-Rocks formed by R. Creek (Gt. Gl. slate)
U-Egg shaped boulder (Gt. Gl. slate)
V-Marked rock
W-Large rock point of view of last portrait. The points on number of rock marked by a plate were determined trigonometrically. The present position only of these points as shown. They change very rapidly

COURTESY OF THE ACADEMY OF ARTS AND LETTERS

OBSERVATIONS OF THE YOHO GLACIER

By A. O. Wheeler

One of the objects of the recently organized Alpine Club of Canada is the study of prominent glaciers of the region, with a view to obtaining information concerning the formation and flow, advance or retreat of those upon which no observations have as yet been made, and of adding to existing information where some little work in this direction has been done. Speaking generally, it is desired to add the Club's mite to scientific knowledge of glacial action by instituting yearly observations of the more prominent and accessible ice-cascades of the Canadian Rockies.

With two noteworthy exceptions, the observations made thus far have been so casual as to be, practically, of no value. The exceptions are: those by George and William S. Vaux,* members of the Academy of Natural Sciences of Philadelphia, and by William Hittell Sherzer, Ph.D., of Michigan State College, under the auspices of the Smithsonian Institution of Washington.

Investigations of the Illecillewaet glacier at the summit of the Selkirk range, near Glacier station on the Canadian Pacific railway, were begun by George and William S. Vaux in 1887, when photographs were obtained of the ice-tongue. They were taken up systematically in 1894 and have been continued yearly since then. Other glaciers upon which they have made observations are: the Asulkan glacier in the Selkirks, and the Victoria and Yoho glaciers in the Main range.

* Active members of the Alpine Club of Canada.

The results of their labors—and a good deal of it has been hard work—are set forth in a number of monographs written for the proceedings of the Academy of Natural Sciences of Philadelphia and for "Appalachia," the publication of the Appalachian Mountain Club of Boston, and subsequently issued as excerpt copies.

The expedition of Dr. Sherzer was made in 1904, supplemented by additional observations in 1905. He applied his investigations to five glaciers: The Victoria, Wenkchema and Yoho in the Main range, and the Illecillewaet and Asulkan glaciers in the Selkirk range. The account of his surveys and observations is given to the public in a most instructive and splendidly illustrated monograph, reprinted from Smithsonian Miscellaneous Collections (Quarterly issue), Volume 47, Part 4, No. 1567. In it Dr. Sherzer gives a description of the several glaciers, their sources, surroundings, action and general characteristics, and draws most interesting and conclusive deductions from his notes. The theory here advanced that the origin of "Block moraines" is due to seismic disturbance, is valuable in view of the fact that, at the present date, no snowfield or glacier in either range carries a load of rock fragments of sufficient size to form moraines similar to those studied by Dr. Sherzer under that name. The moraines referred to were found at no great distance from the ice-tongues of the Victoria, Wenkchema and Illecillewaet glaciers.

Owing to close proximity of the Club's annual camp for 1906, the Yoho glacier was the first taken up, and the initial work last summer is now set forth:

The triangular elevated area of mountain peaks and ridges bounded on the eastern side by the trough of the Bow and Mistaya rivers, on the western side by the trough of the Amiskwi river, Blaeberry river and Middle Fork of the Saskatchewan river, and on the

south by the trough of the Kicking-Horse river and Bath creek, comprises the Waputik mountains along the Bow river, the President range along the Amiskwi river, and a high range of peaks, as yet without specific name, extending into the apex of the triangle. It contains approximately 400 square miles and nearly through its centre lies the line of the Continental watershed, attaining a maximum elevation of 10,731 feet above the sea in Mt. Balfour, situated near the centre of the tract.

The accumulated ice and snow collected in the interior basin, or series of basins, of this mountain area is named on Government maps the "Waputik Snowfield." This snow or icefield—the latter a more appropriate term, for the snow is but a shallow covering—is practically cut in two by Mts. Gordon and Olive and the ridges of which they form a part. The northern and larger part is the one with which we have to do at the present, and, for the sake of convenience, it is here spoken of as the "Wapta icefield." It has an area of approximately from twenty to twenty-five square miles, and is enclosed in a basin surrounded by Mts. Gordon, Olive, Thompson, Baker, Aysha peak, Mts. Collie, Habel and McArthur, Isolated and Yoho peaks, together with their connecting ridges.

In its turn, the icefield is divided into three principal component parts by lateral rock ridges having precipitous escarpments facing westerly and covered on the eastern sides by snow, where it has piled up in great mounds and slopes. The most western section drains to the Yoho valley, which opens southward from the centre of the tract, chiefly by the Habel glacier, the source of Twin Falls creek. There is also an outflow to the north, between Mts. Habel and Collie. The next section drains both north and south, but chiefly to the south, the iceshed lying close to the northern edge. It furnishes the supply for Yoho glacier, the

principal source of the stream of that name. Section No. 3 contains the Continental watershed and drains in small part to No. 2, but chiefly to the east by the Bow glaciers, forming the main source of the Bow river, and by Peyto glacier, a source of the North Saskatchewan river. There are a number of minor overflows, but those named are the principal.

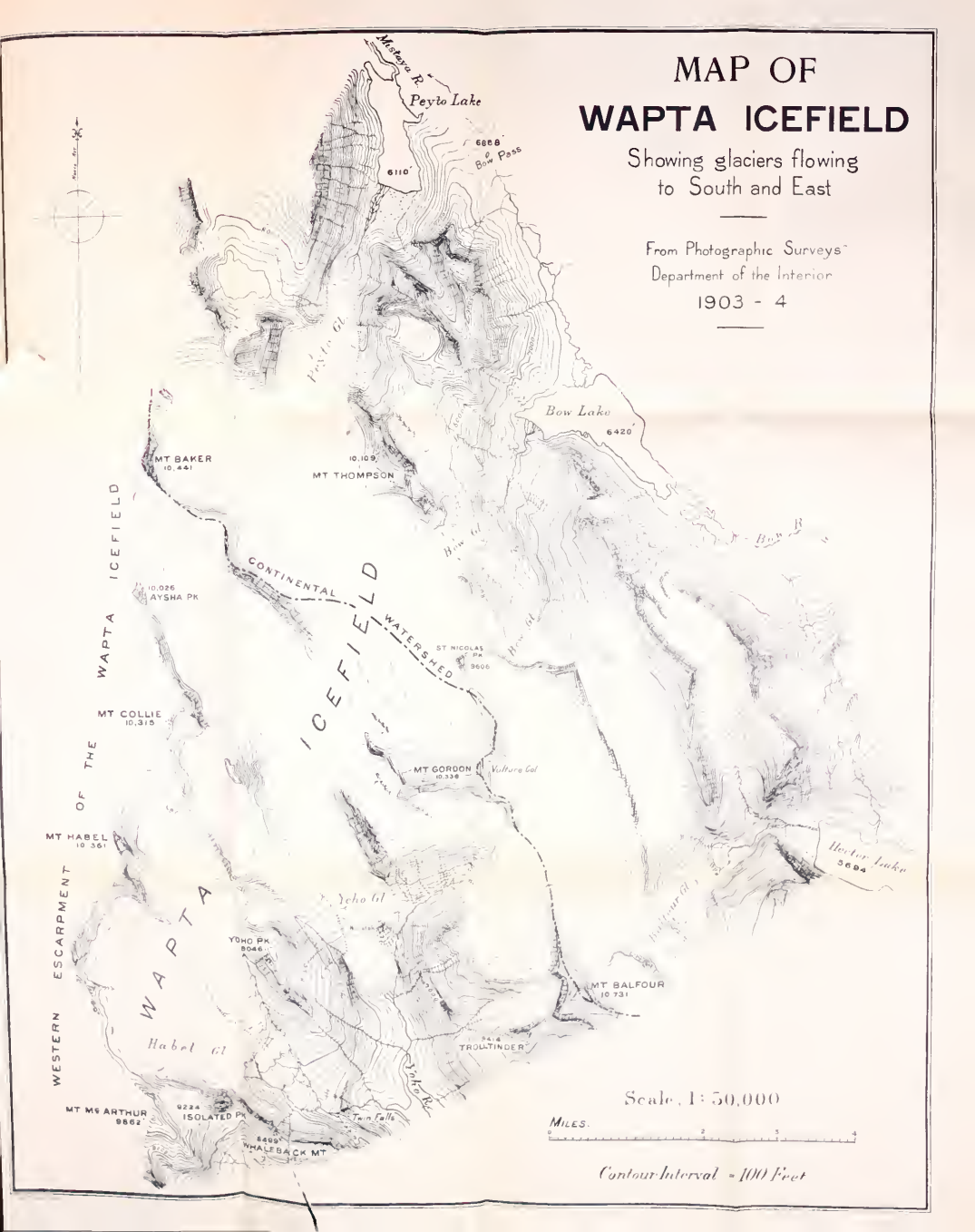
Owing to its position, balanced astride of the Continental divide, the Wapta icefield is of exceptional interest. It feeds four good-sized streams. Two lead through mountains and rolling plains to the Atlantic ocean and two, by a wilder and more broken route, through canyons and dense forests to the Pacific: on the north the Blaeberry river, on the south the Kicking-Horse river, both tributaries of the mighty Columbia; and on the east the Bow river, flowing to the Saskatchewan by a devious southern route, and Mistaya river, flowing direct to the Saskatchewan and thus to Hudson's bay.

The Yoho glacier is the largest outflow from the Wapta icefield. It has little length—less than two miles,— breaking almost directly from its névé between the rocky steeps of Mt. Gordon on the east and Yoho peak on the west, the latter separating it from the Habel glacier. On account of the short run between rock-bound sides, the glacier carries a very small amount of debris and is of remarkable purity. For the same reason its moraines are poorly developed. A short distance above the tongue, the ice stream divides and flows around a knob of rock or "nunatak," which it covered at an earlier date and has now almost wholly encircled by a moraine. The eastern arm is small. At the head of this rock outcrop the main flow breaks into a series of beautiful séracs, reaching across the entire channel in chaotic confusion. The rock sides of Yoho peak, show very distinctly the "plucking" or stripping action of the ice when the glacier

MAP OF
WAPTA ICEFIELD

Showing glaciers flowing
to South and East

From Photographic Surveys
Department of the Interior
1903 - 4



Photo, Byron Harmon

THE ICEFALL OF THE YOHO GLACIER

was much larger and far more powerful than at present. The accompanying illustration shows the dividing rock embossment surrounded by moraine and the wildly broken séracs extending across the glacier. The action of the glacier as an irresistible plane, shaving off the mountain side, is well depicted on the left hand.

The main stream of the Yoho river issues from a fine cave which it has hollowed out in the ice-tongue. The front of the forefoot is precipitous, rising sharply about 150 feet. The slope then assumes a more gentle phase, and walking on the ice between the crevasses, which are here longitudinal, is an easy matter.

On the 14th of July, a committee of five members of the Alpine Club left camp with one of the daily parties making the round trip of the Yoho valley. They stopped for the night at Laughing Falls camp and started early next morning for the glacier. On the road they picked up Mr. George and Miss Vaux, who were camped several miles nearer the ice.

Three independent sets of observations were made to establish initial data from which to start a series of annual observations: (1) to obtain rate of flow; (2) to ascertain retreat or advance; (3) to observe the annual change in the ice formation at the snout. For the first, a row of metal plates were fixed in position across the main ice stream. A suitable base line was then carefully measured along the mountain slope on the eastern side, at a height overlooking the ice. While reaching this position, an interesting feature was noticed in a long line of piled-up tree trunks in various stages of decay, parallel to the trend of the glacier. The adjoining slopes have been swept clear of timber by an avalanche, and are now covered by scrub growth and a few small trees, indicating that, at the time of the avalanche, the ice of the glacier was on a level with the tree trunks. It is at the present time several hun-

dred feet distant and many feet below. In his monograph, Dr. Sherzer refers to this feature and states that he measured the oldest living tree he could find growing in the path of the avalanche, and it had only 47 rings of growth.

Six plates, eight inches square and a quarter-inch thick, having on the under side a piece of inch and a quarter pipe, one foot long, to act as an anchor, were now set at approximately regular distances across the width of the glacier, at a place where the surface was slightly undulating, and as nearly as possible at right angles to the flow. At each point where a plate was set a hole was bored in the ice with an augur and the anchor dropped into place. A surveyor's transit was next set at each end of the measured base and angular readings taken on poles placed in the centre of the plates, thus fixing their position accurately with regard to the established base line. The ends of the base line, on prominent boulders embedded in the mountain side, were carefully marked with red paint and a suitable inscription. Similar readings taken from the same base points at any future date will at once indicate the changed position of the plates and, provided there has been no local displacement, will give an accurate estimate of the flow of the surface of the glacier at each point where a plate was set.

The plates and method were the same used by Messrs. George and William S. Vaux for the Illecillewaet glacier. It was now found—and has since been learned that the same experience applied to the Illecillewaet glacier—that the kind of plate used was not a good one; for, returning across the ice later on, it was seen that each plate was raised more than an inch above the surface, owing to the melting of the ice where exposed to the sun, which had not taken place to a similar extent at the bottom of the holes. It is presumed this will continue, day by day, until the plate

topples over. Even then, it should remain stationary on the surface, unless struck by a rolling boulder or undermined by a rivulet.

Work was next carried to the moraines in front of the ice-tongue, on the east side of the river. They are of a somewhat nondescript character and represent rather incipient lateral moraines, formed by the ice-nose during its protracted retreat, than perfectly formed terminal moraines. The valley floor is here traversed by rock ribs, grooved and polished by the ice, stretching down it longitudinally. On one of these moraines two, deeply imbedded, boulders were marked with red paint and the distance measured to the nearest ice for future reference. Photographs, also, were taken from the boulders for annual comparison of the changes occurring in the ice front through melting and disintegration.

Mr. George Vaux pointed out the marks placed by Miss Vaux in 1901, which were still quite legible. At that date a line was drawn in red paint down one of the rock ribs referred to, as nearly as possible at right angles to the flow of the most advanced ice. It was now found that the most advanced ice had retreated about seventy-six feet, yielding an annual average retreat of fifteen feet. This, however, would not necessarily represent the retreat for any one year, for the ice may have been stationary or even have advanced a little during the period.

In his notes of the Yoho glacier, Dr. Sherzer writes: "In August, 1901, independent marks were established by Miss Vaux and H. W. DuBois, from the former of which it was found that the ice here has retreated 111 feet in three years, or at an average rate of 37 feet a year. This measurement was made to the glacier itself and not to the detached block which has been the nose. Measured to the block, the distance was 92.1 feet, giving an average of nearly 31 feet a year, with a

retreat of 23 feet for the year 1903-4." The measurements now made were to the nearest ice. Mr. Vaux's marks were renewed and the present farthest point of advance marked on the same rock rib, at a distance of seventy-six feet.

On the western side of the stream, a gigantic boulder was found, marked with the legend, "Sr., A, 8|17|'04. To ice 79.4 ft." The marks and measurement were made by Dr. Sherzer in 1904. A measurement now made to the nearest ice gave 79.6 feet, showing that the ice was, practically, in the position it had occupied when the previous measurement was made.

The accompanying map of the tract here referred to as the Wapta icefield is copied from a topographical map of the Yoho valley section of the mountains, now in course of preparation from Government photographic surveys, and is reproduced by permission of Dr. E. Deville, Surveyor-General of Dominion lands.

During the annual camp of the Club for 1907, the above observations will be checked and the changes noted for contribution to a series of records. Observations, also, will be commenced on the Horseshoe glacier at the head of Paradise valley, where the annual camp will be held.

FIELD NOTES OF OBSERVATIONS.

Taken on the Yoho Glacier.

July 15th, 1906.

To Obtain Rate of Flow.

Readings taken on plates set across the ice forefoot of the Yoho Glacier, from a base on the eastern mountain slopes.

Readings at Sta. A.

	Circle Right.		Circle Left.	
	A	B	A	B
on B =	180°00′	360°00′	360°00′	180°00′
on No. 1 =	102°08′	282°07′	282°07′	102°06′
" 2 =	95°41′	275°40′	275°40′	95°39′
" 3 =	93°45′	273°44′	273°44′	93°43′
" 4 =	90°54′	270°54′	270°53′	90°52′
" 5 =	88°58′	268°58′	268°57′	88°56′
" 6 =	87°46′	267°46′	267°65′	87°44′

For Advance or Retreat.

On terminal moraine on east bank of river, rock No. 1, marked :—

" A.C.C., No. 1, July 15, 1906.
Nearest ice 27½ft."

At highest point of moraine, at a distance of 79.3 feet southerly from rock No. 1, took photograph of most advanced ice.

(See Plate)

Rock No. 2, on same moraine, marked :—

" A.C.C., No. 2, July 15th, 1906, 33.6 ft."

Took photograph of front of glacier from this rock.

Mr. George Vaux renewed the marks placed by Miss Vaux in August, 1901.

The marks were :—" V | X, Aug., 1901."

These were placed on west face of a rib of rock on the east side of the river, as nearly as possible at right angles to the line of the most advanced ice.

Took photograph of front of glacier at a point along rock rib, 6½ feet nearer to the ice. Marked this point " V. P."

(See Plate)

At a point 76.5 feet northerly, along the same rock rib, marked west face of rock as follows ;—

A. C. C.	July 15, 1906	
Pt, of ice with	in line rock mark'd "A" on opp. bank (Sherzer)	Sight line is parallel to face of glacier as nearly as could be judged.

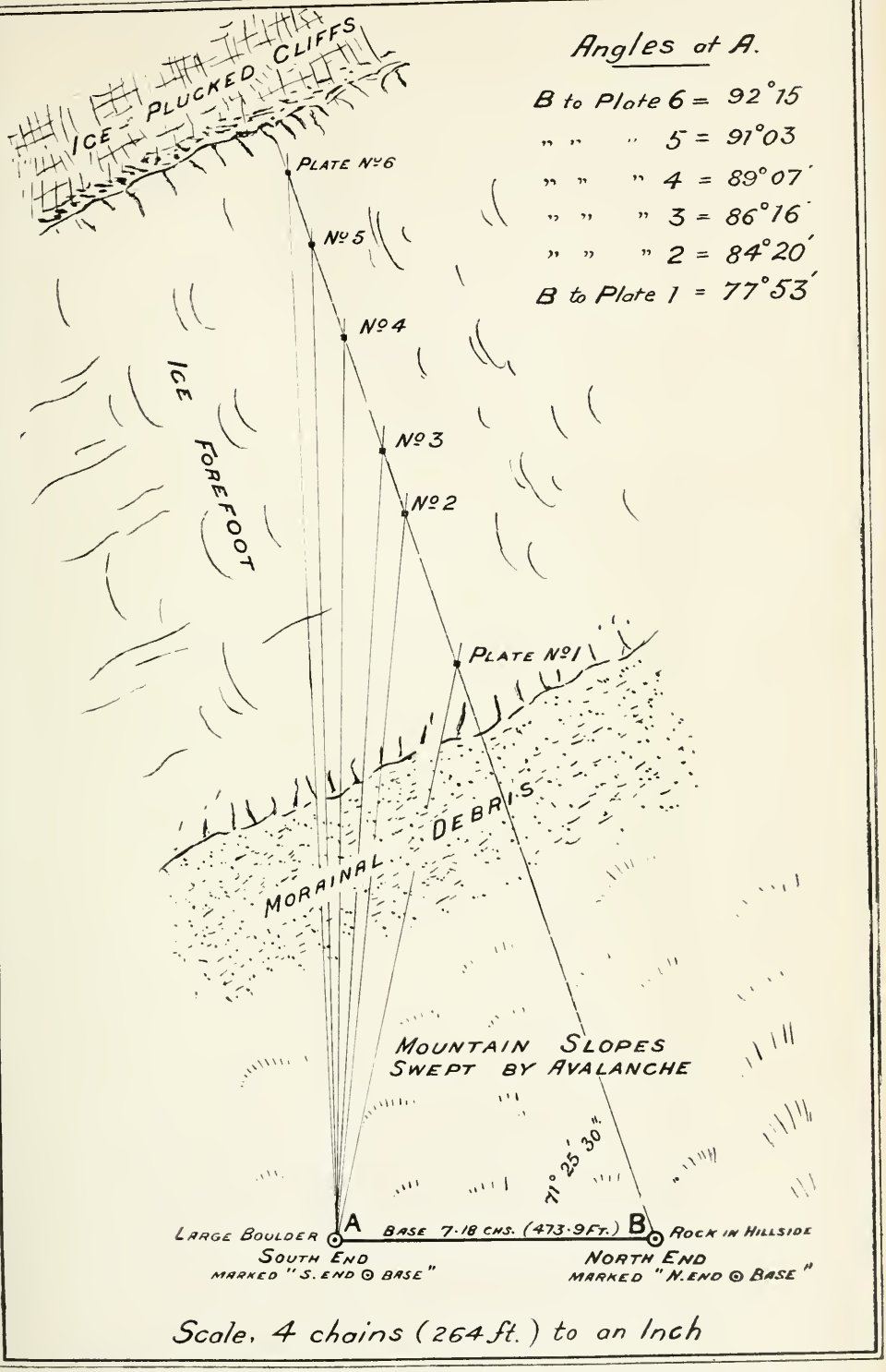
On west bank of stream, on old lateral moraine, found large boulder marked by Dr. Sherzer as follows :—

" Sr "
" A 8/17/'04 "
" **X** To ice 79·4 ft."

Measured from this boulder to nearest ice on left hand = 79.6 feet; and to nearest ice on right hand = 89.5 feet.

VIEW OF THE ICE FOREFOOT OF THE YOHO GLACIER FROM ROCK No. 2

SHOWING ICE SNOUT OF YOHO GLACIER, ON JULY 15, 1906, FROM VIEW POINT 6½ FEET NEARER ICE THAN THE VAUX MARKS OF 1902



SKETCH SHOWING THE POSITION OF PLATES SET ON YOHO GLACIER TO MARK RATE OF FLOW.

Official Section.

ALPINE CLUB NOTES

The Editorial Committee desires to acknowledge with sincere thanks the hearty response to its request by contributors of articles to the first issue of the Canadian Alpine Journal; also contributions of photographs for illustrative purposes from the following: Sir Sandford Fleming, Mrs. J. W. Henshaw, Miss M. Vaux, George Vaux, Jr., Howard DuBois, Prof. Chas. E. Fay, Prof. H. C. Parker, Rev. S. H. Gray, Frank Yeigh, F. W. Freeborn, W. T. Robson, W. Nicholson, F. C. Brown, A. O. Wheeler, M. P. Bridgland, W. S. Jackson, P. D. McTavish, and D. Warner.

* * *

Attention is called to the excellent illustrations in this volume by Byron Harmon. Mr. Harmon attended the Yoho camp, and obtained a fine lot of alpine and camp views. Full sets or any number required, can be had on application. His studio at Banff is prepared to furnish most artistic and beautifully finished views of the Rocky mountain region, particularly of the vicinity of Banff, at a low cost.

The pictures here reproduced were presented to the Club by Mr. Harmon.

* * *

It is understood that the Rev. Geo. R. B. Kinney, of Michel, B.C., has a series of fine views taken during the camp week, which may be had on application Several of them appear in this volume.

We wish also to tender our sincere thanks to the Detroit Photographic Company, who have kindly volunteered to place their series of Canadian Rocky Mountain views at our disposal for illustrative purposes. The fact that we have not taken advantage of the offer is due to the large amount of illustrative material supplied to the Journal by our own members.

We now take this opportunity of calling the attention of our members to the magnificent Rocky mountain views placed on the market by this company. They are from the camera of the well-known traveller and lecturer, Mr. G. H. Peabody, whose work is justly celebrated for artistic effect and clearness of detail. The Company sells these beautiful seven by nine-inch views, with highly glazed finish, for the moderate sum of fifty cents each.

* * *

The Alpine Club of Canada will always be glad to give information to parties desirous of visiting the Canadian Rockies for the purpose of camping, hunting, fishing, exploring, or viewing the scenic splendors of the region. It will also place such parties in communication with reliable outfitters and guides, a number of whom are connected with the Club.

Requests for the above information should be addressed to the President, Arthur O. Wheeler, Box 167, Calgary, Alberta, Canada.

* * *

It is suggested to members who contemplate making trips in the Canadian Rockies for the purposes above named, that they should secure the services of those outfitters and guides who warmly supported the organization of the Club, and who gave their services and

outfits free of charge to make a success of the first summer camp at the summit of the Yoho pass. That they are competent men is well illustrated by their splendid work at the camp.

Their names are: R. E. Campbell, Laggan and Field; Otto Bros., Field, Leanchoil and Golden; E. C. Barnes, Banff; S. H. Baker, Glacier.

* * *

It is desired, specially, to bring to the notice of our members, Mrs. J. W. Henshaw's recently published book, "The Mountain Wildflowers of Canada," embracing the flowering plants within the tract of country lying between the prairie and the Pacific ocean, along the line of the Canadian Pacific Railway. The book is an excellent work and will undoubtedly become one of the text-books of the region, upon this particular subject.

The plan of arrangement by colors, much simplifies the grouping of specimens collected, and the indexing under both English and scientific names renders identification easy. The book fills a long-felt want by those who are not scientific, and Mrs. Henshaw has conferred a great boon on the public by her splendid work.

It may be had from Wm. Briggs, of Toronto—price $2.00.

* * *

It will be seen by reference to the Librarian's report that contributions to our library already amount to seventeen volumes, the majority valuable works relating to the Canadian Rocky mountains. The President also has in hand a large number of photographs and

maps awaiting a suitable building in which they can be set up. Every possible endeavor should be made by our members to augment this nucleus of a library.

A movement is now on foot to obtain a suitable building at a suitable spot, where these valuable books, maps, and photographs may be placed to the best advantage. The matter will be brought up at the coming annual meeting in Paradise valley.

* * *

The Executive of the Club will always be pleased to furnish to members, as far as it can, information concerning the mountain regions of Canada, and mountain regions generally. It is hoped to publish with our next issue a complete bibliography of the Canadian Rockies.

Those desiring information on the subjects indicated above are requested to address the Secretary of the Club, Mrs. H. J. Parker, 160 Furby street, Winnipeg, Manitoba.

REPORT OF SECRETARY

The Editorial Committee of this journal has asked me to give a sketch of the Alpine Club, with a report of its progress up to April 15th of the current year. To begin before the beginning, it was foreshadowed twenty-four years ago on a clear, bracing, sunny day, when Sir Sandford Fleming, K.C.M.G., his son, S. Hall Fleming, the late Principal Grant of Queen's University, and party with pack train emerged from the slow, difficult forest trail and rested at the welcome meadow on Rogers' pass. Inspired by the glacier-mountains rising far and high about them, they resolved themselves into a Canadian Alpine Club; elected officers; passed a resolution of gratitude to Major Rogers, discoverer of the pass; proposed the conquest of the most formidable peak in the whole region; drank the Club's health in a stream sparkling at their feet; and so ended. But the incident was prophetic as well as gay and picturesque. And that the element of gaiety was in it, Sir Sandford gives evidence, when he tells how these grave and reverend seniors performed a game of leapfrog as an act of Olympic worship to the deities in the heart of the Selkirks.

Since that day on Rogers pass, the alpine idea has been stirring in the Canadian mind, faintly at first and slowly, but gradually increasing until it gathered enough momentum to be called by that potential term—a movement. In the winter of 1905-6, appeals were made privately and through the press to persons proper to the project—appeals which won a response justifying the calling of a meeting in March, when twenty-eight delegates from every part of the Dominion gathered in Winnipeg, and the movement assumed tangible form. On March 27th, Mr. A. O. Wheeler, F.R.G.S., assisted by the Rev. Dr. Herdman, gave an illustrated lecture, "The Wonderland of Canada." On the following day at noon Mr. Wheeler addressed the Canadian Club on Canadian Mountaineering, and in the afternoon the Club was formally organized, with seventy-nine members, Sir Sandford Fleming being chosen as Patron and Mr. Wheeler as President, both by hearty acclamation. The inaugural dinner followed in the evening, when some stirring speeches were made born of experiences in rare altitudes, and the healths of the King (God bless him!), the Club and its officers, were drunk with all the enthusiasm of a young mountaineering organization.

The seventy-nine members of a year ago have, up to the present date of writing, increased to two hundred. Membership is divided into five grades: Honorary, Associate, Active, Graduate and Subscribing. The first named consists of those who are eminently distinguished in mountaineering, exploration or research. Among the eight elected as honorary members of the Alpine Club of Canada, are Professor Charles E. Fay, President of the American Alpine Club; Edward Whymper and Dr. J. Norman Collie, of the English Alpine

Photo, Byron Harmon

ON THE SUMMIT OF MOUNT VICE-PRESIDENT

ON THE SUMMIT OF MOUNT BURGESS

Club, and Colonel the Hon. A. Laussedat, of the Geographical Society of Paris. Associate members are those who may not or may be able to qualify as active members, yet who wish to strengthen the Club by contributing twenty-five dollars annually to its maintenance. The first to volunteer as an associate member was Mr. J. D. Patterson, Woodstock, a well-known climber. Sir Sandford Fleming, and Mr. Wm. Whyte, Second Vice-President, Canadian Pacific Railway Company, followed, and then the Rev. C. W. Gordon, D.D., and E. B. Drewry, Esq. To these original associate members, other five have been added during the year. Active members are those who have made an ascent of at least 10,000 feet above sea level in some recognized alpine region; or those who have contributed to Canadian Alpine literature by scientific publications, based upon personal experience. Graduating members are those not yet qualified for active membership, but who are given two years to become so. This probation is not renewable under the auspices of the Club. Subscribing members are those who wish to keep in touch with the Club by receiving its reports and other literature. They have no other privileges. Active members pay $5.00 annually, or $50.00 for a life membership. We have one life member—Professor Herschel C. Parker of Columbia University. The annual fee for graduating and subscribing members is $2.50 and $2.00 respectively.

The Constitution provides for a summer camp in some strategic place, where graduating members may qualify for active membership, and all except subscribing members may foregather for climbing and mountain study. The first session of this school of mountaineering was held July 9-16, 1906, on the summit of the Yoho pass, between two grey rock-peaks, by the margin of a mountain tarn of purest emerald-green, the most limpid and radiant eye that alplands ever opened to see blue sky, withal. Forty-four graduated to active membership and one hundred or more members were in attendance at some time during the week. Eight high mountains were climbed and daily excursions made to contiguous points of interest, and into the Yoho valley to the Wapta glacier, where metal plates were set out to measure its movement.

For the unqualified success of this first annual "meet" of the Club, first credit is due to the President, whose generalship, including a patient and amiable faculty for detail, won enconiums from all. Thanks to Mr. Wheeler, the "meet," which began as an experiment, ended as an institution. Hearty thanks are owing to many others, but notably to Mr. J. D. Patterson; to the Dominion and Alberta Governments; to the C. P. R. Company, the Royal North-West Mounted Police, the Superintendent of the National Park; and last but not least, to those fine fellows and true lovers of the hills, the men in buckskin—our mountain outfitters. Without the generous help of all these, the Yoho camp had not been possible.

The next session of this charming summer school will be in Paradise valley, where there are a score and more glacier mountains near at hand. The present indications are that the attendance will be much larger than last year. The camp will

be situated on a beautiful meadow at the foot of the Horseshoe glacier, at the base of Mt. Hungabee, which closes the valley on the south. These delightful summer outings are no idle holiday. There is no foolishness in mountaineering; it is too vigorous a pastime. Even the nonsense that may escape at intervals around the camp-fire takes on a sober coloring from the grim old heights, that have kept watch for ages over these gaily-flowered alpine meadows and sombre green wooded valleys.

During the Christmas season, the President made an Eastern tour, giving illustrated lectures at Winnipeg, Toronto, Woodstock, Collingwood and Ottawa, thereby awakening interest in mountaineering and adding somewhat to the Club's exchequer. In Ottawa, he addressed the Canadian Club on Canadian mountaineering.

On January 11th, a meeting was held at Winnipeg to discuss the affairs of the Club. The meeting was adjourned to Calgary for the 17th of January. It was decided to publish the first issue of the Canadian Alpine Journal under the auspices of the Club, and $800.00 of the Club's revenue was voted for this purpose. It was also decided to contribute $50.00 to help pay for the handsome marble monument recently erected in honor of Sir James Hector at Laggan station by his friends in Canada, the United States and England.

The affairs of the Club are in its own hands under the Executive, which advises and acts independently, if the Club may so direct. Election to membership is by vote of the whole Club through the ballot. The standard of qualification may not be lowered, but as climbing becomes more general, it will certainly be raised. The Alpine Club of Canada is as democratic as the Church itself: any man of good character who fulfils the conditions of active membership, is eligible.

The first annual meeting was held on the summit of the Yoho pass by the light of the camp-fire, when the President gave an address and the Secretary and Treasurer presented reports. The officers were all re-elected, and Mr. S. H. Mitchell was appointed Assistant Secretary. Mr. Mitchell is both efficient and willing, and has borne the burden of the Secretary's work ever since. Very few days pass without letters of enquiry or applications for membership.

The Club is growing fast, but not too fast. The only royal road to membership is by the "Associate" way of twenty-five dollars a year. It is a worthy way and an honorable for men whose circumstances will not permit them to qualify, by way of crag and precipice and glacier; and it is money invested in nationhood, yielding a far-off interest, not of tears but of noble, patriotic temper. For the Alpine Club of Canada will, more than any national sport in the Dominion, weld together the provinces in the bonds of brotherhood; and furnish training in the more Spartan virtues of times of peace. It will not be many years before it will have entrenched itself deep in every province between the two oceans, when its membership will be in the thousands, and each and every Canadian mountaineer make the Club's motto his own—"sic itur, ad astra."

Elizabeth Parker, Secretary.

STATEMENT OF TREASURER

to 31st December, 1906.

Receipts.

Proceeds of illustrated lecture by Messrs. Wheeler and Herdman, on "The Wonderland of Canada," of the 27th of March, 1906.....	$ 17 45	
Associate members' fees	150 00	
Active members' fees	332 00	
Graduating members' fees.....	92 00	
Proceeds of summer camp in the Yoho valley.	26 47	
Total	———	$617 92

Disbursements.

Printing and stationery	$ 49 03	
Typewriting	1 50	
Postage and express.....	19 60	
Bank exchange and commission.....	80	
Total	———	70 93
Balance on hand		$546 99

D. H. Laird, Treasurer.

22nd April, 1907.

We have examined the books and accounts of the Treasurer of the Club to 31st December, 1906, and find them correct and that the above is a correct summary.

S. H. Mitchell,
J. Holmes Graham.

REPORT OF LIBRARIAN

The library of the Alpine Club comprises seventeen volumes, all of which have been donated. They may be enumerated in order of donation, as follows:—"The Selkirk Range," two volumes, from the author, A. O. Wheeler; "Dent's Mountaineering," from S. H. Mitchell; "Among the Selkirk Glaciers," by the Rev. W. S. Green, presented by Ferdinand Meinecke; "England and Canada, a Summer Tour between Old and New Westminster," from the author, Sir Sandford Fleming, K.C.M.G.; "Mountain Wildflowers of Canada," by Julia W. Henshaw, the author; "The House of Sport," composite authorship, from S. H. Mitchell; "Climbing in the Himalayas," from Dr. J. Norman Collie, the author; also "Climbs and Explorations in the Canadian Rockies," by H. E. M. Stutfield and Dr. J. Norman Collie, presented by Dr. Collie; "A Guide to Zermatt and the Matterhorn," from Edward Whymper, the author; "Camp Fires in the Canadian Rockies," by Hornaday and Phillips, presented by the Secretary; four volumes of "Appalachia," covering the years of mountaineering in the Rockies and Selkirks, from the Appalachian Mountain Club; an edition de luxe, "California and Alaska and over the Canadian Pacific Railway," by William Seward Webb, presented by W. T. Robson; and "Canada," painted by T. Mower Martin, described by Wilfrid Campbell, the gift of Clark Bros. & Co., Winnipeg.

In addition, the Club has received by purchase the first number of a series of monographs, called "Alpina Americana," to be published yearly by the American Alpine Club.

Mr. Tom Wilson of Banff, himself a collector of Rocky Mountain literature, has kindly volunteered to keep watch for the acquisition of rare old books dealing with early history relating to the Canadian mountains.

It is perhaps worth noting that of the seventeen volumes forming the nucleus of the library, eight were written by our own members, and the Appalachian volumes also contain much matter contributed by members of our Club.

We hope that the library will be augmented during the current year, by many valuable additions, and that the Club will enact some legislation by which these books may be made accessible to members, such as the establishment of a library building at a suitable point in the mountains.

Respectfully submitted.

Jean Parker, Librarian.

Edouard Feuz
Swiss Guide

H. G. Wheeler
Asst. Guide

M. P. Bridgland
Chief Guide

Gottfried Feuz
Swiss Guide

GUIDES IN CHARGE OF CLIMBING—YOHO CAMP

A WELL EARNED REST—MOUNT VICE-PRESIDENT

YOHO CAMP

CIRCULAR ISSUED

The Alpine Club of Canada

FIRST SUMMER CAMP IN THE YOHO PARK

The camp is for the purpose of enabling members of the Club to meet in the mountain regions of Canada, and graduating members to qualify for active membership by climbing a mountain at least 10,000 feet above sea level.

The camp will open on Monday, July 9th, and close Monday, July 16th.

A start for the camp will be made from Field station on the Canadian Pacific Railway, early on Monday morning. Members attending are requested to arrive at Field, if possible, by the evening train of July 8th, but the morning train throughout the week will be met.

The number of persons who can attend the camp is limited to one hundred.

Charges.

Active members will be charged one dollar ($1.00) per day while at the camp, to cover board and equipment. This does not include hotel expenses.

All graduating members who attempt to qualify for active membership and reach 9,000 feet above sea level will be charged at the above rate.

All graduating members who fail to reach 9,000 feet above sea level, and all persons other than members, will be charged at the rate of two dollars ($2.00) per day.

The altitude of the camp is 6,000 feet above sea level.

Active members are privileged to bring their wives or husbands, who will be charged at the rate of two dollars ($2.00) per day. Otherwise, except in the case of the press, it is necessary to be a member of the club to attend the camp.

All nominations for membership must be proposed by three members and be in the hands of the Secretary of the Club before the 1st of June.

Members to be eligible for the privileges of the camp must be in good standing; that is, have paid their dues for the current year.

The above charges include transport of baggage, and, as far as possible, of visitors to and from the railway and to and from the various points of interest in the Yoho valley, for which excursions will be arranged daily.

No person attending can bring more than forty pounds of baggage. If in excess of that amount they will be refused transport until the weight has been reduced to the required limit. Baggage should be as light as possible, and should consist of two pairs of blankets, weighing about fifteen pounds, a small feather pillow, a change of clothes and boots, toilet articles, etc. No trunks or boxes can be handled.

Those climbing require heavily soled leather boots, well set with Hungarian nails. Knickerbockers, puttees, sweater and knockabout hat furnish the most serviceable costume.

No lady climbing, who wears skirts, will be allowed to take a place on a rope, as they are a distinct source of danger to the entire party. Knickerbockers or bloomers with puttees or gaiters and sweater will be found serviceable and safe.

Each member who intends to climb should bring a pair of colored glasses. Colored mica glasses are suggested. These can be bought from any druggist at about 50c. per pair.

As the number of persons who can attend the camp is limited to one hundred, you are requested to notify the Secretary of the Committee (Mr. H. G. Wheeler, Banff, Alberta,) as soon as possible. The applications to attend will be accepted in the order in which they are received, due allowance being made for distance.

Please state on what date you will arrive at Field and for how many days you will remain in camp.

On arriving at Field, all whose applications have been accepted, will be supplied with Club badges. Persons unable to produce their badges will not be afforded transportation to the camp.

An endeavor will be made to obtain reduced rates from the Canadian Pacific Railway, and if successful those booked to attend will be duly notified.

Please take notice that under the Constitution the First Annual Meeting of the Club will be held at the Yoho camp.

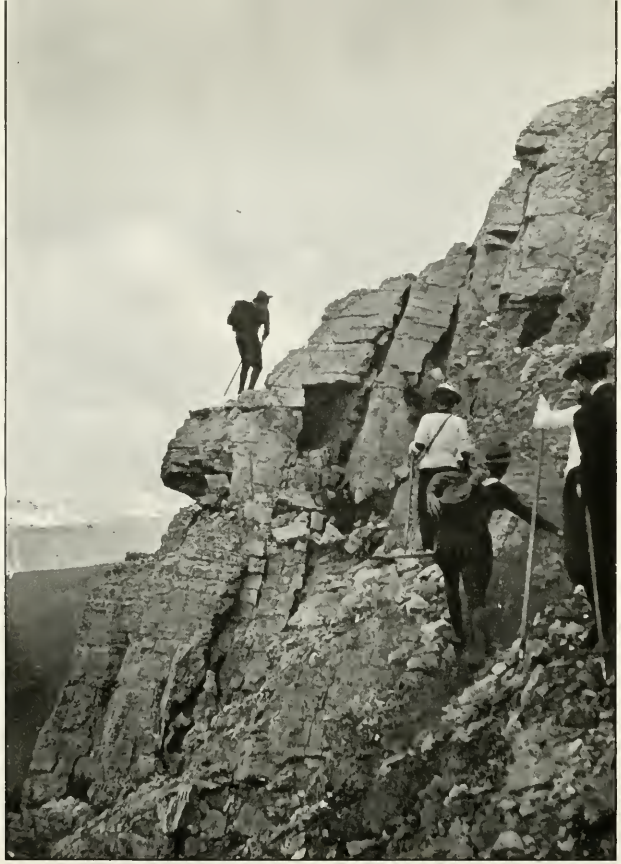
In order to become effective at the meeting, all nominations for membership and proposed amendments to the Constitution should be in the hands of the Secretary of the Club not later than 1st of June next.

Nomination slips may be had from the Secretary of the Club on application.

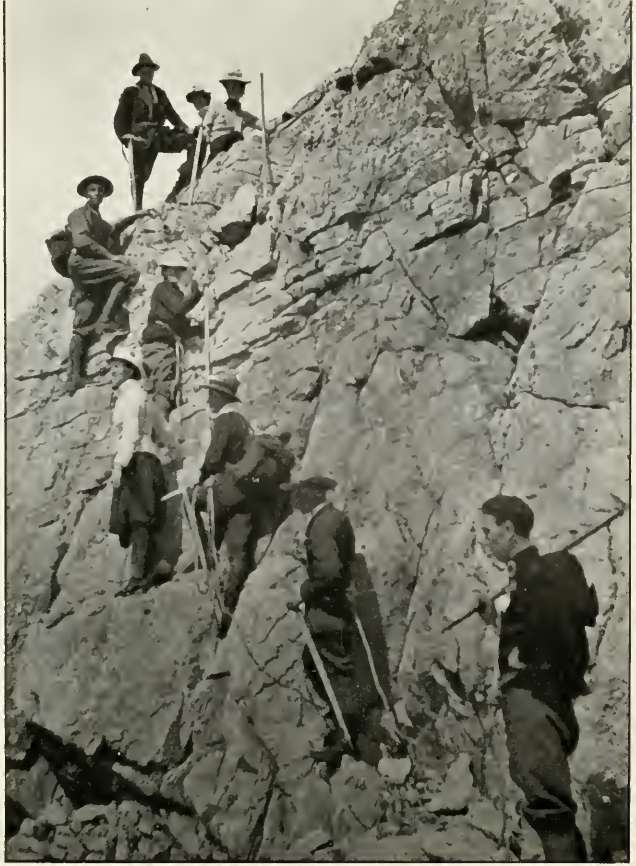
Amendments to the Constitution require to be proposed by five active members.

H. G. Wheeler,
Secretary, Yoho Camp Committee,
Banff, Alberta.

Elizabeth Parker,
Secretary, Alpine Club of Canada,
160 Furby Street, Winnipeg, Man.



AN AWKWARD CORNER
MOUNT VICE-PRESIDENT



A PIECE OF ROCK WORK
MOUNT VICE-PRESIDENT

REPORT OF CHIEF MOUNTAINEER

The mountaineering was in charge of M. P. Bridgland, assisted by H. G. Wheeler, both of the Topographical Survey of the Rocky mountains. Two Swiss guides, Edouard Feuz, Jr., and Gottfried Feuz, of Interlaken, were loaned by the Canadian Pacific Railway Company, and one of these usually accompanied each official climb. A number of other gentlemen, who had had experience in mountaineering, rendered good service to climbing and exploring parties, viz.: The Rev. Dr. Herdman, J. D. Patterson, E. O. Wheeler, Rev. A. M. Gordon, P. D. McTavish, the Rev. Geo. Kinney, Rev. A. O. MacRae, D. N. McTavish and Rev. J. H. Miller.

MT. VICE-PRESIDENT

(10,049 feet above sea level).

The camp was opened officially on July 9th. On the 8th the chief mountaineer, accompanied by the two Swiss guides, the Rev. Dr. Herdman and P. D. McTavish started for Mt. Vice-President, to select the best route for the ascent by other members of the Club. The object was to choose a route as varied as possible, affording, not only rock-work, but also some work on snow and ice; further to select suitable resting places and to establish a 9,000-feet elevation, so that advantage could be taken of the privileged rates to climbers reaching that height above sea level.

Leaving the camp at 6 a.m., the party followed the trail to the summit of the Yoho pass and then, turning to the right, headed for the lower part of the shoulder extending southward from Michaels Mt. The bushes were wet and everyone was soaked, but in about half an hour the shoulder was crossed near timber-line. The party then traversed a long rock slide and worked its way up some steep snow slopes to the arete between Michaels Mt. and the main mass of the mountain, reaching it at 8:30.

From this point the way led along the arete, which was badly broken in places, offering some very interesting bits of rock-work. In one spot it narrowed down to a knife-edge, descending abruptly to the glacier on either side. About two hours' climbing along this arete brought the party to Angle peak,* beyond which it was an easy walk across the snowfield to the final peak, about a mile distant and one hundred feet higher. The summit, 10,049 feet above sea level, was reached at 12:30 p.m., after six and a half hours of steady climbing.

* Angle peak, as indicated by the name, is a sharp angle of rock rising above the north escarpment of the Vice-President ridge, about a mile east of the summit of the mountain. The name was first applied by the Rev. James Outram and is here used for lack of a better.—Ed.

A short time was spent at the summit for rest and refreshment, and then the descent was commenced. Near Angle peak, the party turned to the right and travelled down the centre of the snowfield, enjoying a short glissade near the crest. A little further, a large cave was crossed on a snow-bridge and some steep snow slopes descended to the lower part of the neve. A short walk across the snowfield followed, and then a number of crevasses. These were crossed on a narrow neck of ice and, passing directly below a group of seracs, the party worked its way down to the level tongue of the glacier below, which afforded an easy path to the lateral moraine. It was now a simple matter to cross the rock-slide and go down through the forest to the trail leading to the camp, which was reached at 6 o'clock.

On July 10th the first official climb in connection with the camp was undertaken. The party was in charge of M. P. Bridgland and the Swiss guide, Gottfried Feuz, assisted by the following active members of the Club, viz.: J. D. Patterson, Rev. Geo. R. B. Kinney and P. D. McTavish. The trail to Inspiration point was followed until above the heavy timber, when turning sharply to the left, the open alps below Michaels Mt. were passed through and the shoulder crossed a little higher up than on the previous occasion. The rock-slide was then traversed and the same route followed as on the 8th.

From the time the rock-slide was crossed until the summit was reached, rain fell steadily, accompanied by a cold wind, and much of the time it was impossible to see more than a few yards ahead. The party remained at the summit half an hour. It was too cloudy to see anything and too cold to remain long.

The descent was by the route selected on the previous occasion as far as the shoulder of Michaels Mt., where the party turned to the left and crossed over to the trail by the way followed in the morning.

Left camp at 5:30 a.m. and reached the summit at 11:30. The descent was commenced at 12 o'clock and camp reached at 3:25 p.m. Time of ascent, 6 hours; time of descent, 3 hours 25 minutes; total for climb, 9 hours 25 minutes.

The following graduated to active membership:

Dr. A. M. Campbell
R. Haggen
Miss E. B. Hobbs
Stanley L. Jones
T. Kilpatrick
C. R. Merrill
H. W. McLean
Miss K. McLennan
D. N. McTavish.

On July 11th the party was in charge of M. P. Bridgland and the Swiss guide, Edouard Feuz, assisted by the active members, P. D. McTavish and the Rev. J. H. Miller.

The day was fine and the route followed the same as on the previous day. The party remained at the summit one and a half hours.

Left camp at 6 a.m.; arrived at the summit at 1:30 p.m.; commenced descent at 3 p.m., and arrived at camp at 6:30.

Photo, Rev. Geo. B. Kinney

THE UPPER SNOWFIELD—MOUNT VICE-PRESIDENT

Time of ascent, 7 hours 30 minutes; time of descent, 3 hours 30 minutes; total for climb, 11 hours.

The following graduated to active membership:

T. A. Hornibrook	W. Nicholson
Mrs. Stanley Jones	Miss A. R. Power
J. W. Kelly	Rev. J. R. Robertson
Miss L. E. Marshall	Miss A. M. Stewart
S. H. Mitchell	

On July 12th the party was in charge of H. G. Wheeler and the Swiss guide, Edouard Feuz, assisted by the active members, E. O. Wheeler and the Rev. A. M. Gordon.

With the exception of a few slight showers towards evening, the weather was all that could be desired.

The party left camp at 6 a.m. and reached the summit at 12:30. The descent was commenced at 1:30 and camp reached at 5 p.m. Time of ascent, 6 hours 30 minutes; time of descent, 3 hours 30 minutes; total for climb, 10 hours.

The following graduated to active membership:

F. C. Brown	Miss Jean Parker
J. A. Campbell	Miss F. Pearce
P. M. Campbell	C. B. Sissons
Miss M. T. Durham	Miss E. R. Smith
Geo. Harrower	H. M. Snell
H. G. Langlois	D. Warner
Rev. A. O. MacRae	

On July 13th the party was in charge of M. P. Bridgland and H. G. Wheeler, assisted by the active members, Rev. G. R. B. Kinney, Dr. A. M. Campbell and D. N. McTavish.

The weather was showery during the morning and fine and bright for the rest of the day. The same route was followed for the ascent, but as it had been found that the snow-bridge over the cave was unsafe, owing to the continued warm weather, the party when returning followed the arete a short distance past Angle peak, and then descended to the snowfield, reaching camp by the usual route.

A start was made from the camp at 6 a.m. and the summit reached at 1 p.m. The descent was commenced at 2 p.m. and the camp reached at 6:10.

Time of ascent, 7 hours; time of descent, 4 hours 10 minutes; total for climb, 11 hours 10 minutes.

The following graduated to active membership:

Rev. Alex. Dunn	D. H. Laird
Miss I. W. Griffith	A. H. Smith
B. Harmon	Miss E. Sutherland
Miss A. L. Laird	

MT. PRESIDENT

(10,287 feet above sea level).

On July 14th the party was in charge of M. P. Bridgland and the Swiss guide, Edouard Feuz, assisted by the active member, E. C. Barnes.

The weather was all that could be desired, bright sunshine prevailing throughout the day. As it was a small party, the

route was changed so as to give a most interesting rock climb up the face of Michaels peak to its summit, from which point the arete was followed to join the line of previous ascents.

On reaching the summit of Mt. Vice-President, it being an ideal day, the guides continued the climb to the summit of the President, while the party was resting. A steep descent led to a snow col about two hundred feet below the summit of the Vice-President, and a similar ascent on the opposite side led to the summit of the President. The trip there and back took an hour, a short time being spent in building a cairn on the highest rock point.

The party left camp at 5:50 a.m. and arrived at the summit at 12:45. The descent was commenced at 3 p.m. and camp reached at 6:35. Time of ascent, 6 hours 55 minutes; time of descent, 3 hours 35 minutes; total for climb, 10 hours 30 minutes.

The following graduated to active membership:

J. H. Graham	Miss J. M. Porte
H. G. H. Neville	Miss J. L. Sherman

Taken as a whole the official climb was a marked success. Forty-two graduated to active membership. Of this number fifteen were ladies. There was not one case of failure, a fact that speaks well for the stuff of which our graduating members are made. While the climb was not a dangerous one, it was distinctly strenuous, and the facts that it presented nearly all the varied conditions of mountain climbing and for the best time made took 9 hours and 30 minutes show that it was a feat of very considerable magnitude for young men and women in their first attempts at mountaineering, and one well worthy of commendation.

In addition to the official climbs a number of others were made:

MT. BURGESS

(8,463 feet above sea level).

On July 10th a party in charge of the Swiss guide, Edouard Feuz, Jr., made the ascent of Mt. Burgess, a climb of considerable difficulty.

The names of those participating were as follows:

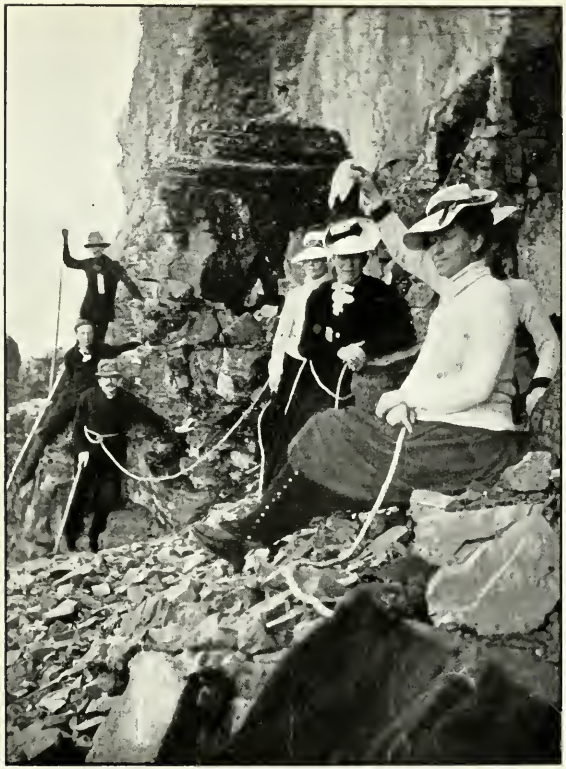
J. A. Campbell	Miss E. R. Smith
Miss A. G. Foote	H. M. Snell
Miss A. R. Power	Miss A. M. Stewart
Rev. J. R. Robertson	

MT. WAPTA

(9,106 feet above sea level).

On July 11th the following gentlemen made the ascent of Mt. Wapta, under the guidance of Gottfried Feuz, viz.:

Dr. P. M. Campbell	D. Warner
Rev. A. M. Gordon	E. O. Wheeler
Rev. Dr. MacRae	



A CLIMBING PARTY
Mt. Burgess

DESCENDING THE GLACIER
Mt. Vice-President

The party started at 8 a.m., spent 45 minutes on the summit and returned to camp at 2:15 p.m. The climb was made from the Burgess trail by way of the west face.

On July 12th a party, consisting of M. P. Bridgland, Miss L. E. Marshall and P. D. McTavish made the ascent of Mt. Wapta via the southwestern arete.

On July 13th the third climb of Mt. Wapta was made, by way of the west face, under the leadership of Edouard Feuz, Jr. Those who took part were as follows:

S. H. Baker	Miss Francis Pearce
S. H. Mitchell	C. B. Sissons
Miss Jean Parker	E. O. Wheeler

On July 14th a fourth climb was made of the same mountain by D. N. McTavish and C. R. Merrill, under the guidance of Gottfried Feuz. The climb was made up the northeast face and was found to be a difficult one, taking from 9:30 a.m. until 3 p.m. for the ascent. The descent, by the usual route, was commenced at 4 p.m. and camp reached at 5:50.

MT. COLLIE

(10,315 feet above sea level).

On July 12th, J. D. Patterson, accompanied by the Swiss guide, Gottfried Feuz, ascended Mt. Collie from a camp pitched the night before at the foot of the Twin falls. The ascent was made by way of the Yoho glacier and the return on the opposite side of Yoho peak, by way of the Twin falls. By a curious coincidence, the peak was climbed on the same day by Miss Henrietta L. Tuzo, a member of the Club, but one who was not visiting the camp. Under the care of the Swiss guide, Christian Kaufmann, she made the ascent by a different route, and the two parties met upon the summit.

MT. FIELD

(8,645 feet above sea level).

On July 12th, under the guidance of the Rev. J. C. Herdman, the following party made the ascent of Mt. Field:

Rev. Alex. Dunn	D. H. Laird
J. W. Kelly	S. H. Mitchell
Miss A. L. Laird	

MTS. AMGADAMO AND MARPOLE

(9,537 feet and 9,822 feet above sea level).

On July 16th, in charge of the Swiss guides, Edouard Feuz, Jr., and Gottfried Feuz, the Rev. A. O. MacRae, the Rev. Alec. Gordon and the Rev. Alex. Dunn made the first ascent of Mt. Marpole, and en route made the first ascent of the peak which they named Amgadamo. An account of the climb will be found among the pages of the mountaineering section of this volume.

Respectfully submitted.

M. P. Bridgland, Chief Mountaineer.

TRIPS

Among other events of the camp week the following trips require special mention, viz.:

A two-day trip around the Yoho valley, starting out by the lower trail and returning by the upper. A night was spent at a camp close by the Laughing falls. This trip took in all the varied and strikingly beautiful alpine scenery of the valley and presented a seemingly endless panorama of towering peaks, waterfalls, glaciers, snowfields, ice-cascades, precipices, lakes and forest, almost bewildering in their spectacular effects, and filling the beholders with wondering delight.

Four such trips were made, on consecutive days, and in all sixty persons were taken round the valley. Each party was accompanied by a number of ponies to carry the baggage for the night out, for crossing mountain torrents and to afford mounts for those who were tired. This trip was voted the feature of the camp.

Three trips were made, under the leadership of the Rev. J. C. Herdman, to the glacier below the northeastern escarpment of the President range, known as the Emerald glacier.

Twenty-seven persons participated in these trips, and much enjoyment and general information concerning glaciers were derived therefrom.

A special trip was made to the close vicinity of the Takakkaw falls, under the leadership of H. G. Wheeler. The party consisted of nineteen, and were greatly delighted with the trip.

On the 14th and 15th, a special committee, representing the Scientific section of the Club, made a trip to the Yoho glacier for the purpose of initiating yearly observations of its various changes and rate of flow. A full report of the expedition will be found in the Scientific section of this volume.

In addition to the above, trips were made daily to Inspiration point, reached by a corkscrew trail branching from the Upper Yoho valley trail at a point near the camp. This point is well named, for the view from it not only takes one's breath away in wonder, but fills the mind with an inspiration that it never again loses. Also, to Lookout point on the Lower Yoho valley trail, presenting a magnificent view of the full majesty of the Takakkaw falls, with its thousand feet of a sheer drop. The Burgess trail seemed a favorite, and many visitors came to and returned from the camp by that route, from which the Presidents range and Emerald mountains with their glaciers, icefalls and torrents, are seen to the greatest advantage; while below, Emerald lake nestles in a setting of deep green forest.

LAUGHING FALL CAMP

YOHO VALLEY TRIP

A word with regard to these trails of the Yoho valley: They are the outcome of the artistic, engineering skill and keen appreciation of the value of magnificent alpine scenery as a boon to mankind, possessed by the late E. J. Duchesnay, Assistant General Superintendent of the Pacific Division of the Canadian Pacific railway. In the location of the pony trail around the Yoho valley and below Mts. Wapta and Field, every possible vantage point has been grasped with a skill that could only have been realized by a true lover of Nature.

RECEIPTS AND EXPENDITURES

for Yoho Camp

Receipts.

Grant, Government of Alberta	$250 00	
Private subscription	170 00	
Paid in for board and accommodation	458 25	
Paid in for distribution among employees	61 00	
Auction sale of ice-axes	75 75	
Surplus supplies sold	263 87	
		$1,278 87

Expenditures.

Provisions	$613 12	
Stationery, printing, postage, telegrams	38 93	
Expressage and freight	49 60	
Wages	93 00	
Camp outfit	123 95	
Distributed among employees	59 50	
Bonuses to outfitters	239 00	
Purchase of ice-axes	30 00	
Railway fares of employees	5 30	
		$1,252 40

Balance paid in to general fund $26 47

Arthur O. Wheeler,
Chairman of Camp Committee.

CONSTITUTION

1. The name of the Club shall be **"The Alpine Club of Canada."**

2. The objects of the Club are:

(a) The promotion of scientific study and exploration of Canadian alpine and glacial regions.

(b) The cultivation of art in relation to mountain scenery.

(c) The education of Canadians to an appreciation of their mountain heritage.

(d) The encouragement of the mountain craft and the opening of new regions as a national playground.

(e) The preservation of the natural beauties of the mountain places and of the fauna and flora in their habitat.

(f) The interchange of literature with other alpine and geographical organizations.

WORK OF THE CLUB.

3. The work of the Club shall be:

(a) The exploration and study of Canada's alpine tracts; and, with this end in view, it shall gather through its members literary material and photographs for publication and dissemination, and such publications shall be placed on record with the Secretary and Librarian, and be distributed to the members of the Club and to corresponding organizations.

(b) The promotion of the study of glaciers and glacial action in Canada, and of art as applied to mountain regions, for which purposes glacial and art sections shall be formed.

(c) The organization of a corps of reliable guides and outfitters, who shall be available in connection with the work of the Club.

(d) The sphere of action of the Club shall not be confined to Canada alone, but may extend to all the high mountain ranges of the world, and one of the objects of this organization shall be to obtain information concerning other alpine regions and to come closely in touch with those who are interested in all such matters.

MEMBERSHIP.

4. Membership shall be of five grades, viz.:

Honorary Members. Those who have pre-eminently distinguished themselves in mountaineering, exploration or research and in the sacrifice of their own interests to the interests of the Club shall be eligible for Honorary membership. Honorary members shall be elected only by a two-thirds majority of the recorded votes of the Club.

Active Members. (a) Those who have made an ascent of not less than ten thousand feet above sea-level in some recognized mountain region; their eligibility for election to be decided by the Executive Board.

(b) Those who for eight years prior to the date of organization have been annual visitors to Canada's mountain regions and have contributed to a knowledge of the same by means of scientific or atristic publication.

(c) Except as hereinafter specified, Active members only shall be entitled to vote.

(d) Active members may obtain life membership by the payment of fifty dollars, and shall thereafter be exempt from the payment of all dues.

Associate Members. Those who are unable to qualify as Active members, but, owing to the objects of the Club, desire to affiliate therewith and lend a helping hand towards its maintenance.

Graduating Members. Those who desire to become Active members, but are not yet qualified. They will be given two years to qualify, but such probation is not renewable.

Subscribing Members. Those who are unable to take an active part in the outdoor work of the Club, but desire to keep in touch with it by receiving its publications and exchanges.

OFFICERS.

5. (a) The officers of the Club shall consist of a Patron, a President, Vice-Presidents, a Secretary, a Treasurer, and a Librarian, who shall be elected to office biennially.

The President and Vice-Presidents shall not hold office for more than two consecutive terms.

(b) Officers of the Club shall be elected from the Active membership, but, if it be distinctly in the interests of the Club, as determined by the Executive Board, they may be elected from any other grade except that of Graduating or Subscribing membership, and for their term of office shall be vested with the powers and privileges of Active membership. In such case, however, the election must be by a two-thirds majority of the recorded vote of the Club.

ADVISERS.

6. (a) In addition, there shall be elected not less than three advisers, who, together with the officers, shall constitute the Executive Board of the Club. Their tenure of office shall be governed by subsection (a) of section entitled "Officers." Only residents of Canada shall be eligible for office upon the Executive Board.

(b) Advisers may be elected from any other grade, excepting that of Graduating or Subscribing membership, and for their term of office shall be vested with the powers and privileges of Active membership.

EXECUTIVE BOARD.

7. The Executive Board shall have the general charge, superintendence and control of the affairs, interests and property of the Club. It shall pass upon the eligibility of all proposed members and shall arrange and direct the working details and publications of the Club. The Executive Board shall have power to make by-laws for its own government, not inconsistent with this Constitution, which by-laws shall be submitted by the Board at the first annual meeting thereafter.

NOMINATION AND ELECTION OF MEMBERS.

8. Every nomination for membership must be made by not less than three members of the Club. Such nomination, with a statement of the qualifications of the proposed member, shall be submitted to the Executive Board, which shall pass upon the eligibility of the candidate. A ballot containing the names of such candidates as have been approved by the Executive Board, together with a statement of their qualifications and the names of their sponsors, shall be sent by the Secretary to each Active member. Such ballots as are returned to the Secretary within six weeks after they were sent out shall be canvassed by the Executive Board and the result declared in the minutes of the Board and in the next circular issued to members. A majority of the votes cast shall elect.

NOMINATION AND ELECTION OF OFFICERS.

9. The election of officers shall take place at every alternate annual meeting. Two months before such meeting, the President shall appoint a Nominating Committee of five Active members. This Committee shall prepare a list of candidates for the ensuing term and report it to the Secretary.

A ballot containing these nominations shall be mailed to each Active member at least six weeks before the date of election. At the meeting appointed for the election, these ballots shall be cast and the result declared. In case of a failure to elect, the existing officers shall hold over until their successors are elected.

DUES.

10. (a) Annual dues for Active members shall be five dollars.

Annual dues for Associate members shall be twenty-five dollars.

Annual dues for Graduating members shall be two dollars and fifty cents.

Annual dues for Subscribing members shall be two dollars.

(b) Members in arrears for two years, to whom have been mailed the usual notice for dues and a final notice, shall forfeit membership.

HEADQUARTERS.

11. The headquarters of the Club shall be at the city of Winnipeg.

ANNUAL MEETING.

12. An annual meeting of the Club for the election of officers and the transaction of other business shall be held at the Club's summer camp, or, failing a summer camp, at the Club's headquarters during the month of January.

QUORUM.

13. Seven Active members shall constitute a quorum of the Club for the general transaction of business, and three members of the Executive Board shall constitute a quorum of that Committee for the general transaction of business.

SUMMER CAMP.

14. A summer camp in some suitable part of the mountain regions shall be organized in each year for the purpose of enabling Graduating members to qualify for Active membership, and the members generally to meet together for study and climbing in the alpine districts of Canada.

SPECIAL MEETINGS.

15. Special meetings of the Club may be called by the President or by a Vice-President and the Secretary, acting under his authority. In such case due official notice shall be mailed to all members six weeks before such meeting, stating the purpose for which it is called.

LIBRARY.

16. A library or libraries shall be established where the publications of the Club and books, maps, photographs and works of art relating to mountain scenery shall be gathered together and filed for the use of its members.

AMENDMENTS.

17. Amendments to the Constitution and By-laws may be made at any regularly called meeting of the Club, provided that such amendment or amendments shall have the signatures of not less than five Active members of the Club and are acquiesced in by two-thirds of those recording their votes.

All such amendments shall be mailed by the Secretary to the members, on printed ballots, six weeks in advance, together with the names of the five members proposing the change. Such ballots as have been returned to the Secretary shall be canvassed by a committee appointed by the President and the result declared at the meeting aforesaid.

List of Members.

HONORARY MEMBERS

MRS. H. J. PARKER,
Winnipeg, Manitoba, Canada.

J. NORMAN COLLIE, F.R.S.,
London, England.

E. DEVILLE, LL.D., F.R.S.C.,
Ottawa, Ontario, Canada.

CHAS. E. FAY, Litt. D.
(President American Alpine Club)
Tufts College, Mass., U.S.A.

REV. W. S. GREEN, M.A., F.R.G.S.,
Dublin, Ireland.

COLONEL A. LAUSSEDAT,
Institute of France, Legion of Honour,
Geographical Society of Paris,
Yzeure, Canton d'Allier, France.

EDWARD WHYMPER,
London, England.

ASSOCIATE MEMBERS

MRS. G. A. ANDERSON,
Box 508, Calgary, Alberta.

MRS. P. BURNS,
Calgary, Alberta.

E. L. DREWRY,
Winnipeg, Manitoba.

SIR SANDFORD FLEMING, C.E., K.C.M.G., LL.D.,
Chancellor, Queen's University, Kingston,
Winterholme, Ottawa, Ontario.

REV. C. W. GORDON, D.D. (Ralph Connor),
Winnipeg, Manitoba.

J. D. PATTERSON,
Woodstock, Ontario.

MRS. C. W. ROWLEY,
Calgary, Alberta.

R. STEWART SOLOMON,
Box 82, Cape Town, South Africa.

BYRON E. WALKER,
President, Canadian Bank of Commerce,
Toronto, Ontario.

WILLIAM WHYTE,
Second Vice-President, Canadian Pacific Railway,
Winnipeg, Manitoba.

ACTIVE MEMBERS

***Armstrong, L. O.** Can. Pac. Ry. Co., Montreal, Quebec.

Ascents: Over 10,000 feet above sea level in the Spillamacheen Mts.

***Baker, S. H.** Banff, Alberta.

Ascents: In the Canadian Rockies, Main range—Mts. Shields, Wilcox, Wapta and Cascade; Pobokten, Howse, Bow and Yoko peaks. In the Selkirks—Mt. Afton.

***Barnes, E. C.** Banff, Alberta.

Mountain ascents in Wyoming, Montana and Idaho. In the Canadian Rockies—Mt. Vice-President.

Bathurst, H. M. Winnipeg, Manitoba.

Ascents: Monte Christallo, Dolomites, Tyrol.

Benham, Miss G. E.

44 Dartmouth Rd., Brondesbury, London, N.W., England.

Ascents: More than one hundred and ninety mountain ascents in Enrope, Canada, New Zealand and Japan; the following are the principal: In the European Alps—Mont Blanc, Monte Rosa, Lyskamm, Dom, Matterhorn, Weisshorn, Jungfrau, Dent Blanche, etc. In Canadian Rockies, Main range—Victoria, Lefroy, Temple, Stephen, Balfour, Assiniboine, Fay, Gordon, etc. In the Selkirks—Sir Donald, Dawson, Bonney, Rogers, Swiss Peak, etc. In New Zealand—Mt. Earnslaw. In Japan—Fuji Yama.

***Bridgland, M. P.** Calgary, Alberta.

Topographical Survey of the Canadian Rocky Mts.

Ascents: Numerous ascents in the Canadian Rockies; among others: In Main range—Mts. Temple, Daly, Gordon, Hector, Balfour, Stephen, Habel, Vaux, etc. In the Selkirks—Mts. Rogers, Fox, Selwyn, Bagheera, etc.

***Brown, F. C.** Calgary, Alberta.

Ascents: In Canadian Rockies—Mt. Vice-President.

Burr, Allston, Chestnut Hill, Mass., U.S.A.

Ascents: In Canadian Rockies—Mts. Victoria, Lefroy and Stephen. In the Selkirks—Mt. Sir Donald.

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Ascents: In Canadian Rockies—Mt. Coleman.

***Campbell, A. M., M.D.** General Hospital, Winnipeg, Man.
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Ascents: In Canadian Rockies—Mt. Chaba.

***Campbell, J. A., M.D.** Keene, Ontario.
Ascents: In Canadian Rockies—Mts. Vice-President and Burgess.

***Campbell, P. M., M.D.** Lethbridge, Alberta.
Ascents: In Canadian Rockies—Mts. Vice-President and Wapta.

***Campbell, R. E.** Laggan, Alberta.
Ascents: In Canadian Rockies—Mts. Vermillion, Cascade, Rundle, Aylmer, Inglismaldie, Prospectors' peaks, Niles, Stephen, Victoria, Aberdeen, etc.

Carson, P. A.
Topographical Surveys Branch, Ottawa, Ontario.
Ascents: In Canadian Rockies—Storm Mt., Mts. McArthur (Signal 18) and King. In the Selkirks—Mt. Bonney.

***Coleman, A. P., M.A., Ph.D.**
School of Practical Science, Toronto, Ontario.
Exploration to headwaters of Saskatchewan and Athabaska rivers in 1892 and 1893. Exploration and mapping of Brazeau snowfield in 1903.
Ascents: In Norway—Mt. Galdhopiggen. In Canadian Rockies—Misty Mt., Castle Mt., Mt. Stewart, Mt. Brazeau to 10,500 feet, and a number of unnamed peaks at headwaters of the Saskatchewan, Athabaska and Brazeau rivers. In France—Grand Sablier (Dauphiny). In Mexico—Mts. Orizaba, Colima, Nevada de Toluca.

***Coleman, L. Q.** Morley, Alberta.
Exploration to headwaters of Saskatchewan and Athabaska rivers in 1892 and 1893. Exploration of Brazeau snowfield in 1903.
Ascents: In Canadian Rockies—Misty Mt., Mts. Stewart, Brazeau and Brown.

***Cowdry, E. V.** Waterford, Ontario.
Ascents: European Alps—The Jungfrau, Mettelhorn, Dent du Midi, Gorner-grat, Metteinberg, Mouchjoch.

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Comstock, B. S. 45 Murray St., New York City, U.S.A.
Ascents: In Canadian Rockies, Selkirk range—Mt. Dawson.

Cowdry, N. H. Waterford, Ontario.
Ascents: In Switzerland—Gorner-grat. Minor climbs in Switzerland, Corsica and Rockies.

Cummin, Miss E. P.
113 West Monument Ave., Dayton, Ohio, U.S.A.
Ascents: In Cascade Range—Mt. Hood (Oregon).

Curtis, R. F. 25 Kinross Rd., Boston, Mass., U.S.A.
Ascents: Gray's peak (Colorado). In Canadian Rockies—Mt. Balfour, Abbot pass. In Selkirks—Eagle peak and Mt. Lookout.

***Dunn, Rev. A.** Calgary, Alberta.
Ascents: Ben Nevis (Scotland), Pilatus and Rigi (Switzerland). In Canadian Rockies—Three Sisters (Crowsnest pass), Mts. Vice-President, Marpole (first ascent) and Field.

***Durham, Miss M. T.** Golden, British Columbia.
Ascents: In Canadian Rockies—Mt. Vice-President.

Finlayson, Miss A. Victoria, British Columbia.
Ascents: In Switzerland—Piz Languard and Gornergrat.

Forde, J. P. Can. Pac. Ry. Co., Revelstoke, B.C.
Ascents: Mts. Skikist and Windsor (Coast range, Brititsh Columbia).

***Freeborn, F. W.** 445 W. 21st St., New York City, U.S.A.
Ascents: Breithorn and Gorner-grat (Switzerland). In Canadian Rockies—Mts. Temple, Victoria and Whyte, etc. In the Selkirks—Mt. Rogers.

***Gordon, Rev. A. M.** Lethbridge, Alberta.
Ascents: Monte Rosa (Switzerland). In Canadian Rockies—Mts. Lefroy, Vice-President and Marpole (first ascent). In the Selkirks—Mt. Hermit.

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Ascents: In Canadian Rockies—Mt. Vice-President.

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Ascents: In Canadian Rockies, Main range—Mt. Lefroy. In the Selkirks—Mt. Hermit.

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Ascents: In Canadian Rockies—Mt. Vice-President.

***Haggen, E. A.** Revelstoke, British Columbia.
Ascents: In Eastern Selkirks—Boston Pk. and others.

***Haggen, R.** Revelstoke, British Columbia.
Ascents: In Canadian Rockies—Mt. Vice-President. In the Selkirks—Mt. Begbie (first ascent).

***Harmon, B.** Banff, Alberta.
Ascents: In Canadian Rockies—Mt. Vice-President and Cascade Mt.

***Harrower, G.** Lethbridge, Alberta.
Ascents: In Canadian Rockies—Mt. Vice-President Crowsnest Mt. In the Selkirks—Eagle peak.

***Henshaw, Mrs. J. W.**
Box 29, Vancouver, British Columbia.
Author "Mountain Wildflowers of Canada."
Eight years of botanical work in Canadian Rockies.

***Herdman, Rev. J. C., D.D.** Calgary, Alberta.
Ascents: In Scotland—Ben Nevis and Ben Lomond. In Canadian Rockies, Main range—Mts. Stephen, Vice-President, Aberdeen, Field, Yoho peak, Fairview, etc. In the Selkirks—Mts. Macoun (first ascent), Macdonald, Hermit (first ascent), Avalanche, Lookout, Begbie (first ascent), etc. In Coast range—Mt. Cheam.

***Hobbs, Miss E. R.** Revelstoke, British Columbia.
Ascents: In Canadian Rockies—Mt. Vice-President. In the Selkirks—Mt. Revelstoke.

***Hornibrook, T. A.** Calgary, Alberta.
Ascents: In Canadian Rockies—Mts. Vice-President and Fairview.

Hyde, F. O. Lethbridge, Alberta.
Ascents: Mts. Harrison and Old Baldy (San Jacinto range, S. California).

Jackson, W. S. Upper Canada College, Toronto, Ont.
Ascents: In Canadian Rockies—Mt. Temple. In the Selkirks—Mts. Sir Donald and Bagheera (first ascent).

***Jardine, Mrs. A. B.** Stavely, Alberta.
Ascents: In Japan—Fuji Yama and Asama Yama.

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Ascents: In Canadian Rockies—Mt. Vice-President.

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Ascents: In Canadian Rockies—Mt. Vice-President.

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Ascents: In Canadian Rockies—Mts. Vice-President and Field.

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Ascents: In Canadian Rockies—Mt. Vice-President.

***Kinney, Rev. G. R. B.** Michel, British Columbia.
Ascents: In Canadian Rockies—Mts. Stephen and Vice-President. A number of climbs between 8,000 and 10,000 feet in vicinity of Crowsnest pass.

***Kirk, J. A.** Revelstoke, British Columbia.
Ascents: Mountains in the Kootenays of British Columbia.

***Langlois, H. G.** 149 Rusholm Road, Toronto, Ontario.
Ascents: In Canadian Rockies—Mt. Vice-President.

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Ascents: In Canadian Rockies—Mts. Vice-President and Field.

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Ascents: In Canadian Rockies—Mts. Vice-President and Field.

***Marshall, Miss L. E.** Taber, Alberta.
Ascents: In Canadian Rockies—Mts. Vice-President and Wapta.

***Merrill, C. R.** Stettler, Alberta.
Ascents: In Canadian Rockies—Mts. Vice-President and Wapta.

Miller, C. F.
420 School Lane, German Town, Philadelphia, Pa., U.S.A.
Ascents: In Canadian Rockies, Main range—Mt. Stephen. In the Selkirks—Mt. Rogers. Peaks in Switzerland.

***Miller, Rev. J. H.** Field, British Columbia.
Ascents: In Canadian Rockies—Mts. Stephen and Vice-President.

***Mitchell, S. H.** 567 Spence Street, Winnipeg, Man.
Ascents: In Canadian Rockies—Mts. Vice-President, Wapta and Field.

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Morrison, J. C. Revelstoke, British Columbia.
Ascents: Pike's peak (Colorado).

***MacRae, Rev. A. O., D.D.**
Western Canada College, Calgary, Alberta.
Ascents: In Canadian Rockies—Mts. Vice-President, Marpole (first ascent) and Amgadamo (first ascent). Mt. Baker (near Nanaimo). London Mt. (Kootenays). Mt. Goatfell (Island of Arran).

***McArthur, J. J.** Dept. of the Interior, Ottawa, Ont.
Topographical Surveys, Canadian Rocky Mts.
Ascents: In Canadian Rockies—Mts. Stephen, Field, McArthur (Signal 18), Storm Mt. and others. In the Selkirks—Mts. McKenzie, McPherson, etc.

***McEachran, Miss K.**
505 Sherbrook Street W., Montreal, Que.
Ascents: In Canadian Rockies—Mt. Stephen.

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Ascents: In Canadian Rockies—Mt. Vice-President.

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Ascents: In Canadian Rockies—Mts. Vice-President and Rundle.

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Ascents: In Canadian Rockies—Mt. Vice-President.

***Otto, W. J.** Golden, British Columbia.
Ascents: In Canadian Rockies—Mts. Vaux, Hunter and Yoho peak.

***Paget, Very Rev. Dean, M.A., D.D.** Calgary, Alberta.
Ascents: In Switzerland—Piz Languard, Gorner-grat, etc. In Canadian Rockies—Paget peak.

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†**Parker, H. C., Ph.B.** 21 Fort Green Place, Brooklyn, N.Y., U.S.A.
Topographical investigations in Bow Valley, Alberta (1903). Explorations in Mt. McKinley region, Alaska (1906).
First ascents in Canadian Rockies: Mts. Hungabee, Deltaform, Goodsir, Biddle, Lefroy, Dawson and Gordon.
Ascents: Mts. Sir Donald, Victoria, Temple and Stephen. In Western United States—Sierra Blanca, Mts. Rainier, Shasta and Hood. In Switzerland—Mont Blanc and the Matterhorn.

***Parker, Miss J.** 160 Furby Street, Winnipeg, Manitoba.
Ascents: In Canadian Rockies—Mts. Vice-President and Wapta.

***Patterson, J. D.** Woodstock, Ontario.
Ascents: In Canadian Rockies—Mts. Lefroy, Stephen, Vice-President and Collie. First ascent, Mt. Ball.

***Pearce, Miss F.** Calgary, Alberta.
Ascents: In Canadian Rockies—Mts. Vice-President and Wapta.

***Peyto, W. E.** Banff, Alberta.
Ascents: In Canadian Rockies—Observation peak (Bow pass). To 10,750 feet on Mt. Assiniboine (with Rev. James Outram).

***Plewman, R. E.** Rossland, British Columbia.
Ascents: In the Selkirks, B.C.—Mt. Sir Donald.

***Port, Miss J. M.** Kelowna, British Columbia.
Ascents: In Canadian Rockies—Mt. Vice-President.

***Power, Miss A. R., M.A.** Calgary, Alberta.
Ascents: In Canadian Rockies—Mts. Vice-President, Burgess and St. Piran.

Raymond, Miss M. P. West Newton, Mass., U.S.A.
Ascents: Of more than fifty climbs in the European Alps and Canada the following are mentioned—In the Canadian Rockies, Main range—Mt. Victoria. In the Selkirks—Mt. Sir Donald. In Switzerland—Rothorn, Finsteraarhorn, Great Schreckhorn, Grand and Petit Don, Dent du Geant, Matterhorn, Ober Gabelhorn, Dent Blanche, Eiger, Lauteraarhorn, Jungfrau, Monch, etc. Climbs in the Dolomites.

Ritchie, John, Jr. Box 2795, Boston, Mass., U.S.A.
Ex-President Appalachian Mountain Club.
Ascents: Jungfrau (Switzerland). In Appalachian mountains, Mt. Washington and others.

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Ascents: In Canadian Rockies—Mts. Vice-President and Wapta. In the Selkirks—Cougar Mt., Mt. Begbie (first ascent).

Rowley, C. W. Canadian Bank of Commerce, Calgary.
Ascents: In Canadian Rockies, Main range—Mt. Aberdeen.

***Schaffer, Mrs. Chas.**
Philadelphia, Pa., U.S.A. (c|o Geographical Society of Philadelphia).
Eight years' botanical work in the Canadian Rockies. Investigations at headwaters of Saskatchewan river.

***Sherman, Miss J. L.** Sioux Falls, South Dakota, U.S.A.
Ascents: In Canadian Rockies—Mt. Vice-President.

***Simpson, James** Banff, Alberta.
Ascents: In Canadian Rockies—Mt. Murchison, Wilcox and Pyramid peaks.

***Sissons, C. B., M.A.** Revelstoke, British Columbia.
Ascents: With Photo-Topographical Survey of Canadian Rocky Mts., climbed among others—Mts. Vice-President, Wapta, Ogre, Amiskwi, Glenogle, Twin Glacier.

***Smith, A. H.** Woodstock, Ontario.
Ascents: In Canadian Rockies—Mt. Vice-President.

***Smith, Miss E. R.** Calgary, Alberta.
Ascents: In Canadian Rockies—Mts. Fairview, Burgess, Vice-President and Cascade.

***Snell, H. M.** Winnipeg, Manitoba.
Ascents: In Canadian Rockies—Mts. Vice-President and Burgess.

***Stewart, Miss A. M.** Calgary, Alberta.
Ascents: In Canadian Rockies: Mts. Vice-President, Burgess and St. Piran.

***Sutherland, Miss E.** Winnipeg, Manitoba.
Ascents: In Canadian Rockies—Mt. Vice-President.

***Tuzo, Miss H. L.**
The White House, Warlingham, Surrey, England.
Ascents: Ortler (Eastern Alps). In the Canadian Rockies, Main range—Mts. Victoria, Collie and Mt. Tuzo (Peak seven of the Ten Peaks, first ascent). In the Selkirks—Mts. Sir Donald, Bonney, Rogers, Afton and Swiss and Eagle peaks.

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*Vaux, G. Jr. 404 Girard Building, Philadelphia, Pa., U.S.A.
Glacial studies in the Canadian Rockies and Selkirks of British Columbia, since 1887.
Ascents: In Canadian Rockies—Mt. Stephen. In the Selkirks—Mt. Sir Donald. Gray's peak (Colorado).

*Vaux, Miss M. M. 1715 Arch Street, Philadelphia, Pa., U.S.A.
Ascents: In Canadian Rockies—Mt. Stephen and Abbot pass. In the Selkirks—Mt. Avalanche. Glacial studies.

*Vaux, W. S. 807 Bailey Building, Philadelphia, Pa., U.S.A.
Investigations and surveys of glaciers in the Canadian Rockies and Selkirks of British Columbia, since 1887.

*Warner, D. C. P R. Telegraphs, Winnipeg, Manitoba.
Ascents: In Canadian Rockies—Mts. Vice-President and Wapta.

Watt, J. 17 Maple Avenue, Toronto, Ontario.
Ascents: In the Selkirks of British Columbia—Mt. Sir Donald. Climbs in Switzerland and Corsica.

*Wheeler, A. O., F.R.G.S. Box 167, Calgary, Alberta.
In charge, Photo-Topographical Survey of the Rocky Mts. of Canada.
Ascents: In the Canadian Rockies, Main range—Mts. Hector, Temple, Gordon, Daly, Vaux, Thompson, etc. In the Selkirks—Mts. Dawson, Sir Donald, Purity, Fox, Rogers, Wheeler (first ascent), Swiss peak, etc.

*Wheeler, E. O. Box 167, Calgary, Alberta.
Ascents: In Canadian Rockies, Main range—Mts. Hector, Gordon, Thompson, Vice-President, Wapta, Storm Mt., Observation peak, etc.

*Wheeler, H. G. Box 167, Calgary, Alberta.
Photo-Topographical Survey of the Rocky Mts. of Canada.
Ascents: In Canadian Rockies, Main range—Mts. Hector, Temple, Gordon, Daly, Balfour, Vaux, Thompson, Observation peak, etc. In the Selkirks—Mts. Dawson, Rogers, Fox, Purity, Selwyn, Wheeler, etc.

*Wilkie, O. B. M. Trout Lake, British Columbia.
On Canadian Topographic Survey for determination of Alaska Boundary.
Ascents: Climbs in Lardeau and Kootenay Districts of British Columbia.

*Wilson, T. Banff, Alberta.
Ascents: In Canadian Rockies, Main range—Mts. Stephen, Wilson, Aylmer, Cascade, King, Storm Mt., Crowsnest Mt., Wind Mt., Bonnet peak.

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MacKay, Miss H. Winnipeg, Manitoba.
MacKellar, Miss E. Winnipeg, Manitoba.
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B. S. Comstock, Photo

PINNACLE MOUNTAIN FROM PARADISE VALLEY CAMP

CANADIAN ALPINE JOURNAL

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MOUNTAINEERING SECTION.

THREE ATTEMPTS ON PINNACLE.

By P. D. McTavish.

Pinnacle Mountain is bold and precipitous with somewhat of a castellated appearance. It is situated between Paradise Valley and the Valley of the Ten Peaks and behind or southwest of Mt. Temple, which overshadows it by upwards of 1,500 feet. Its altitude is only 10,062 ft., but the steepness of its walls on all sides, and the rottenness of its rock combine to make it extremely difficult of ascent. In fact it has so far defied the efforts of all who have attempted to reach its summit.

During the summer of 1907, the year in which the Alpine Club of Canada met in Paradise Valley, three attempts were made to conquer it. On June 24 Mr. Forde of Revelstoke with Guide Peter Kaufmann made the first attempt, the Alpine Club sent a party composed of

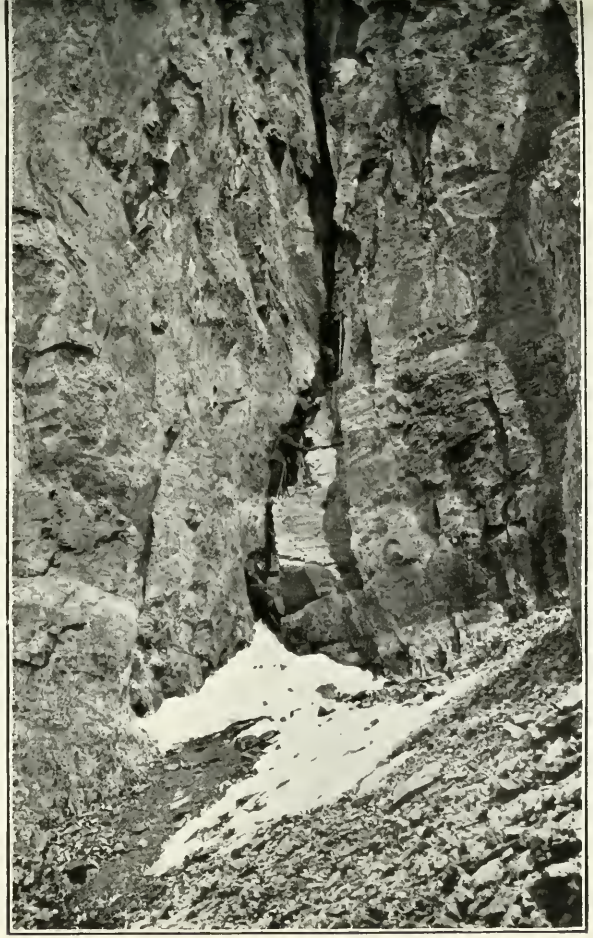
the Reverends J. C. Herdman, J. R. Robertson and Geo. B. Kinney and P. D. McTavish in charge of the guide Edouard Feuz Jr. on July 9; and on August 22 Dr. Hickson of Montreal with both Peter and Edouard made the third unsuccessful attempt.

The Alpine Club's party left camp at six o'clock, and, after the usual tramp through the woods and over the 2,500 feet of loose rock and snow forming the mountain's lower slopes, we encountered the first real work. This consisted in the ascent of a long, steep *couloir* filled with much loose rock on which rested, most insecurely, from six to twelve inches of snow and ice. In spite of the greatest precaution we dislodged some boulders and a considerable amount of finer debris, snow and ice. As we approached the top of the chimney the snow increased in quantity and steepness, becoming almost perpendicular, so our ice-axes were called into use.

Regarding this particular part of the mountain Mr. Forde writes in his account of the climb: "About seven o'clock the first work began at an elevation of about 9,000 feet, up a small *couloir,* and, as the rocks were icy and covered with from six to twelve inches of snow, the rope was brought into use. Here one of the pleasures so often experienced by mountain climbers fell to the lot of the writer, that of hanging on to the face of the rock wall while the man above sent a steady stream of snow and lumps of ice on the top of his head and down his neck, while his fingers were getting numb and stiff and he was beginning to doubt the existence of such things as toes. Surely one is justified in asking at such times the question: Is life worth living? After about two hours of this work, during which the two climbers 'spelled' each other in cutting steps and finger-holds, about 125 feet had been gained, and they reached a small shoulder of the mountain, projecting into the Wastash Pass. Up this shoulder the travelling was comparatively good for 200 feet more, and then they were brought to a stop

E. Feuz, Photo

THE PRECIPITOUS CROWN



E. Feuz, Photo

THE CRACK, PINNACLE MT.

by a perpendicular rock wall, the face of which was composed of loose, shaly rock, affording no secure foothold or hand-hold."

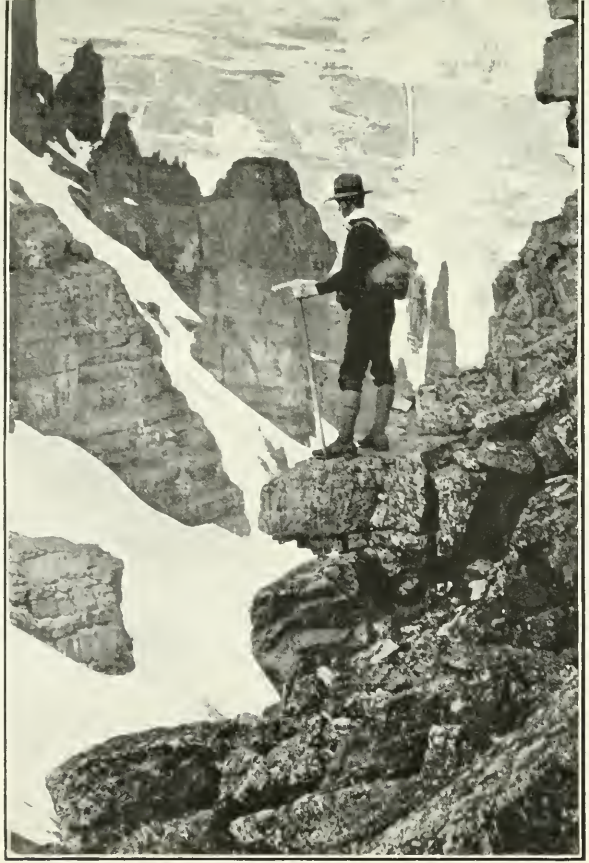
Having finally reached the top of the *couloir* we found ourselves on a narrow ridge which connected a *gendarme* to the body of the mountain. This ridge was so narrow that there was barely room for our party to sit down, while the rock was so disintegrated that we wondered why *col* and *gendarme* did not go crashing to the depths below. We had been climbing five hours, and now halted for a breathing spell and a sandwich. Resuming the climb, we found ourselves confronted by a perpendicular wall several hundred feet in height, therefore turned south towards Eiffel Peak. Our first work was a very difficult descent of about fifty feet which landed us in a sort of funnel-shaped amphitheatre. Its walls were very steep and its outlet led to a perpendicular drop of 500 feet. We crossed safely by a narrow ledge and soon found ourselves on the *col* joining Pinnacle Mountain and Eiffel Tower.

Looking upwards (northerly) Pinnacle Mountain presented the appearance of a succession of cascades of honeycombed rock which seemed ready to crumble were any extra weight put upon them or the rain to saturate them. For an hour we scaled this succession of perpendicular faces and had little trouble except that the rottenness of the rock made more or less hazardous our every movement.

Finally about one o'clock we reached the base of the precipice-walled crown which surmounted the rest of the mountain, the "keep" as it were of the fortress. Its walls rose in a perpendicular face and seemed to defy us. We went to right and to left only to find that the same perpendicular face extended comlpetely around the mountain, guarding jealously its summit. There seemed but one chance: A huge crack cleft the face of the crown, reaching apparently to the summit, and it looked as

though we might be able to work our way up. For about forty or fifty feet we had little difficulty, but beyond that the way was absolutely blocked by the steepness of the rock and its utter lack of hand-holds and foot-holds. For fully an hour the guide struggled at this point. Finally one of the party braced himself and allowed Edouard to climb upon his shoulders in the hope that the advantage thus gained would reveal new possibilities. But the effort was useless and we were reluctantly forced to retreat.

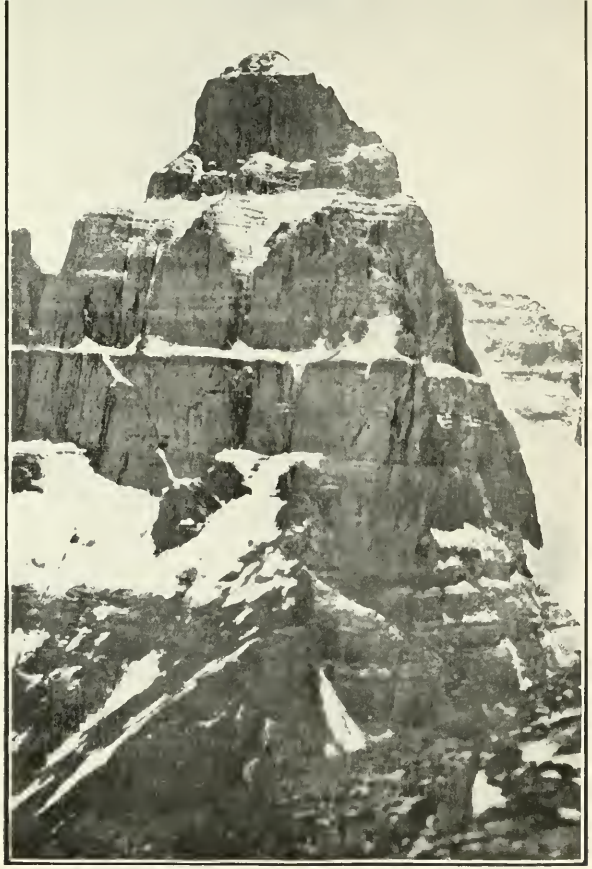
It was now suggested that we try to work our way up the walls of the huge crack at a point farther in where it was not as wide, but upon examination we found these walls covered with ice and the hope of getting up here was quickly dispelled. Then began a more careful examination; but, after reconnoitering to right and left we found no place where there was the slightest possibility of ascending, so returned to the fissure once more. For upwards of an hour we redoubled our efforts at this point, but all to no effect, and finally decided unanimously that we were defeated. Mr. Forde's experience at this point follows: "The foot of the wall was traversed on a small ledge for several hundred feet easterly, along the side of the mountain, above the Valley of the Ten Peaks, but further progress was barred by the ledge ending suddenly. As no place was found at which it was possible to attempt to get higher, the climbers retraced their steps to the shoulder mentioned before and continued around the face of the wall towards Paradise Valley. Here again no practicable route to the top was found, the only place that seemed at all likely to be feasible being a narrow crevice in the face of the wall. This crevice looked anything but promising, but as it was the only chance left, it was attempted and some progress made by pressing the elbows and knees against the sides and working up a few inches at a move. About fifty feet from the bottom of the crevice it widened out to six or eight feet. As the walls were smooth and perpendicular, and the



P. D. McTavish, Photo

SENTINEL PASS

Pass No. 5 of Two-Day Expedition



P. D. McTavish, Photo

PINNACLE MOUNTAIN FROM SENTINEL PASS

former mode of progression of no further service, the only course left was to retreat to the shoulder. Here a council was held and the easterly ledge again traversed in the hope that some possible chance had been overlooked, but the hope proved to be a vain one. At about one o'clock, therefore, it was decided to abandon the attempt."

It was now four o'clock. If loose and rotten rock was dangerous on the ascent, it would be doubly so descending, and it was imperative to commence the descent. With the chagrin of defeat in our minds, we did not particularly relish the anticipation of descending faces of weathered and disintegrating rock, skirting fearsome ledges with foot-holds of questionable security and yawning depths below and, worst of all, lowering ourselves down *couloirs* treacherous with snow, ice and debris.

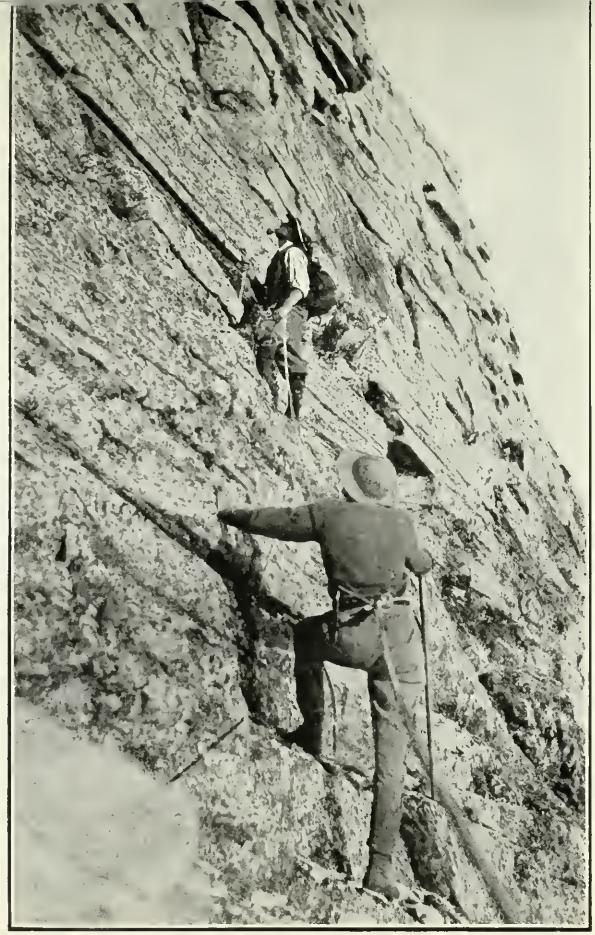
Proceeding carefully we reached the top of the last and longest *couloir* about seven o'clock. To its base the depth was fully 200 feet, and we dreaded this more than any part of the whole descent. The sun was approaching the mountain peaks to the west, the air had become noticeably cool, speed was necessary. Eight hundred feet below was the snow-field; unless we reached it before dark we might have the uncomfortable experience of spending a night above snow-line, an experience which none of us desired. Just as we had nicely entered the chimney the guide, Edouard, called a halt until he should examine another route apparently more feasible. It was; but the first thirty or forty feet seemed quite hazardous, so one member of the party was lowered by a rope to examine the rock carefully. It seemed better than the *couloir* and soon all had descended and we were approaching the snow-field, which we eventually reached about eight o'clock, feeling much relieved that the dangers were over before darkness set in. We arrived at the camp about nine o'clock, just as the evening

shadows were creeping over Paradise Valley, and the warm glow and pleasant crackle of the camp fire were making many merry hearts merrier.

The third attempt of Pinnacle Mountain was made on the 22nd of August last by Dr. J. W. A. Hickson, of McGill College, Montreal. The account of it is given in his own words:

"I started in the afternoon of August 21st from Lake Louise with Peter Kaufman and Edouard Feuz, Jr., and camped one night on the site of the Canadian Alpine Club camp in 1907. We had camped here a week before, but had been driven back from our proposed attempt on Pinnacle by heavy rain and snow. When we were taking supper, in full view of the mountain, it seemed to me that the guides were by no means so hopeful of attaining the summit as they had been previously. Feuz even remarked in no genuinely joking tone: 'Perhaps we won't get to the top.' Needle-like in appearance, its summit covered with fresh snow looked cold and forbidding, and very diminutive alongside of the massive Temple.

"We set out next morning about 5 o'clock, in fine weather. After following the stream which flowed past the camp, we ascended a grassy slope and over some boulders along the left shoulder of the mountain. In about three hours we reached the snow, which was fresh and powdery, and the rope was brought into requisition. Proceeding carefully up the snow-slope, we crossed to the right and following the ridge, which one of the guides had traversed some weeks before, had some good rock climbing. In some place the foot-holds were rendered easier by the hard snow, particularly on a narrow ledge skirting the right shoulder of the mountain near the top; but elsewhere the rocks were unpleasantly slippery through melting snow. We had reached a ledge within what seemed to be about 300 feet below the summit, when further advance was stopped by a precipitous wall



P. D. McTavish, Photo

SCALING CLIFFS OF PINNACLE MOUNTAIN

P. D. McTavish, Photo

ROCK TOWERS OF PINNACLE MOUNTAIN

of smooth rock, about 60 feet high, which apparently could be ascended only through a perpendicular chimney affording no hand-holds except at its base, and having an overhanging rock near its top. Feuz Jr. had already been this far in July 1907 with a small party; and had been obliged to turn back.

"It was now about 10.15 o'clock. The weather though fairly clear, had turned unpleasantly cold, and there were heavy clouds moving from the west with a high wind. After taking some refreshment the guides suggested that they should first try the chimney, in regard to the feasibility of which I was not at all hopeful. As the result of half an hour's work Feuz managed to ascend some 15 or 20 feet, but there was no prospect of getting further in this direction. We then explored both sides of the ledge to discover whether there was any way of working round the wall of rock and ascending to the summit from another side. We came to the conclusion, however, that what seemed to offer a possible means of circumvention was, on account of the fresh snow on the loose rocks, too dangerous to be worth the risk. The guides were strongly opposed to undertaking it. So we left the ridge very reluctantly about 12.30 o'clock with the intention of seeing something more of the mountain by descending on the opposite side to that along which we had come up. But, after getting down about a thousand feet, we were obliged, again owing to the condition of the snow, to ascend in order to resume our previous path. We reached camp at 4.40 p.m. It seems to me that it would be worth while trying this peak again only when it is completely dry, i.e., free of snow for 1,000 feet below the summit. Last summer was notoriously unfavorable for mountaineering, as fresh snow fell almost continuously after the beginning of August on all peaks over 8000 feet."

Defeat does not always mean lack of pleasure, for in mountain climbing (as in most other things) the very

striving itself is enjoyable. "Strive, nor hold cheap the strain." When a party of mountaineers, protected from danger by a careful guide, spend a day on a mountain that tries all their skill and constantly taxes their ingenuity, every moment is replete with pleasure. So our fifteen hours spent on Pinnacle Mountain was a decided success even though we failed to reach the summit. All honor to the man who finally performs the feat.

THE FIRST ASCENT OF MT. GARIBALDI.

By A. T. Dalton.

On the extreme west of the Rocky Mountains system, hard by the waters of the North Pacific, is a mountain range little known beyond its own horizon. Its highest peaks do not compare in altitude with the giants of the Selkirks and Rockies, rising above valleys already at a considerable elevation, but they have the same alpine features of rock and glacier and snow, while their ascent involves climbing almost from the level of the sea. Moreover, they possess an added feature of beauty impossible to the ranges lying further east, their seaward slopes being indented with numerous fiords which find their way often into the very heart of the range.

The peak of greatest height is Mt. Garibaldi—known locally as "Old Baldi"—which stands at the head of Howe Sound, some thirty miles in from the Gulf of Georgia. Every dweller in the lovely Valley of the Squamish, which this mountain overlooks, is as proud of him as he is proud of his country; yet, except to these good people, he is all but a myth. Years ago a party attempted the ascent, but failed; and it looked, as time went on, as if Old Baldi were to crumble away in peace. But in that party were some who were "baffled to fight better," and this is why one stormy night, early in August, 1907, an adventurous group found themselves about a roaring fire in an old log house in the Squamish Valley, forty miles by water from Vancouver.

At six o'clock the next morning under a clear sky, we set out for the coveted summit, following the Tsee-Ki whose source is in Garibaldi's glaciers. At first the travelling was easy, for the rise was gradual and the

country open; and in a few hours we were in the foothills, with the Tsee-Ki's milky waters boiling through canyons, and our mountain looming ever higher and more forbidding. By noon we reached a place where the way by the stream was barred and we were obliged to begin the ascent by a ridge on the left. And now our toils commenced. For 1,000 feet we had some very awkward rock-work made risky by loose fragments; and beyond this, a laborious grind of 5,000 feet up a wooded slope at an angle of 45 degrees. For hours we toiled up that interminable mountain-side with never a glimpse of a view to encourage us; until at last, when quite near the summit of the ridge, we "played out." We had been travelling for twelve hours. Camp was made in an open glade carpeted with heather, and with plenty of wood and pure water, we were soon comfortable for the night.

Early next morning we broke camp and continued the work of the previous day with keen anticipation. In a short while we were rewarded by our first panorama, for all at once we stepped on open ground and, looking back, beheld the whole Squamish Valley lying six thousand feet beneath us with its roads, rivers and farms showing as depicted upon a living map. Beyond lay Howe Sound stretching away to the open sea, and in the far distance Vancouver Island. We were feasting upon this scene when a shout from our amateur guides hurried us on. Almost before we knew what had happened, we found ourselves on the first crest with Garibaldi beyond in full view, and quite close. Towering heavenwards in one magnificent mass of rock, his precipices crowned with hanging glaciers, and all his upper heights wrapt in a mantle of fresh snow, he seemed some terrible monarch of the skies not to be approached by man. A rising ridge in the form of a crescent connected our present point with the glaciers behind the mountain. A steep descent of some three hundred feet

brought us to its crest and along it we took our way. The whole ridge was clothed with fresh green grasses and blossoming heather, through which flowed here and there silvery streamlets of purest crystal. Clusters of trees were scattered about in reckless order, and gorgeous flowers in wild profusion made fragrant the air. In Indian file we moved along, ever on our right the mountain, and far below on the left the Squamish Valley and the ice-clad range beyond. Once a deer went bounding past with swift graceful motion, and then some fleecy clouds floated by. A few hours brought us to a commanding knoll, and here at timber-line we pitched camp in a group of dwarfed balsams. We now had a view behind Garibaldi of a vast sea of unknown mountains, glaciers and lakes.

After a somewhat uncanny night we awoke to find ourselves enveloped in clouds, so dense that our knoll seemed a little island in mid-ocean. All morning was spent in camp in that heavy, silent fog, but in the afternoon two of us set off with one of our guides for the base of the peak. It took two hours to get to it, steadily tramping up slopes of shale and snow in the thick fog. And then we reached a point where there was no sign of vegetation, and from whence we beheld the wildest scene of the trip. We stood on the top of a huge mass of rock, on one side was a precipice vanishing below in clouds, and on the other a very steep slope of trap rock, up which the clouds were surging from out the Tsee-Ki canyons. Within a stone's throw on the left darkly loomed the red walls of the dome of Garibaldi, and from a glacier at its base rushed a noisy little streamlet, the very head of the Tsee-Ki, which we had followed for twenty-five miles..

Early next morning the whole party set out to make an attempt at the ascent; but when we reached the snowfield below the peak, silent, desolate and trackless, the party would go no further. The fog gathered thickly

and it was snowing; so, dejected, we returned to camp. Now happened what nearly ruined the whole expedition. Four of the party wanted to go home, and one of the leaders was willing, but the other bitterly opposed to it. The fate of that virgin peak hung in the balance. It was settled by the "youngster" of the party stepping alongside the "foolish" guide, as he was rated, and with him swearing to retreat not one step till more than mere clouds and snow flurries barred the way to the summit. It had been "do or die" sitting before a cosy hearth in town, so now the only way home was the Spartan one: with your shield or on it!

At sundown the wind veered to the north and in a few hours there was not a vestige of a cloud in the sky. Now we had cold to contend with, for an icy wind blew from the glaciers behind Garibaldi, and our supply of wood was ended. The break of dawn on the twelfth was the scene of a lifetime. All hands were up early and, just as the sun was tipping the surrounding peaks and tinting glacier after glacier, we set off for the third time up that mountain ridge. The peak showed clear but was clad with new snow and looked anything but easy. In a couple of hours we reached the base and here roped, with the two men of the former expedition as guides. Then we stepped out upon the glacier at an altitude of about eight thousand feet, and began to circle the peak—a pyramid rising two thousand feet—by the north. For an hour we walked steadily over new frozen snow of dazzling whiteness, constantly encountering ugly crevasses, the peak on our right, a wall of unscaleable precipices overhung by a glacier. For another hour we hurried on, gradually rising, the silence of those dismal wastes broken only by the sound of an alpenstock biting the frozen snow. Once the whole place was shaken by an avalanche which came thundering down the precipice on our flank. At eleven o'clock we reached the nine-thousand foot level where began the final struggle.

A. T. Dalton, Photo

THE SUMMIT OF MT. GARIBALDI

Peach, Photo

LOOKING EAST FROM THE SUMMIT

Soon we were on one of the frozen faces of the pyramid, a slope of 45°, rounding off abruptly to where, far below, we had passed early in the morning. We made a horizontal traverse of this, negotiated two crevasses, and then began to climb the steep face of iced snow leading to an *arête* above, which would take us to the summit. Every step had to be cut, and the higher we climbed the steeper it grew. Then someone murmured, for the slope became nearly vertical and a merciless wind was whistling across it. Close above, however, was rock, so we worked to this haven. Decidedly unnerved we reached it at last, and clambering up its steep face, gazed over the saw-like edge. What we saw there sickened the bravest of us. We were on the edge of a thin toppling precipice of rotten lava, overhanging a horrible green glacier a thousand feet below, with empty space beneath it again. A cry was raised to return, but our guides were firmer now, and we had to go on. The *arête* was about a hundred yards long, all cracked and crumbling, with its north face, on which we were, a mass of loose slabs of lava, coated with snow and ice. Under this was a bank of snow too steep to use, with two yawning crevasses stretching across it. To the south was the paralyzing "overhang." It took an hour and a half to make that course. Every piece of dislodged rock went either silently flying into dizzy space on one side, or whirring down the other to vanish with an almost human howl in the hungry throat of one of those crevasses.

In a kind of trance we at last crawled up a ridge of soft clean snow, and found ourselves standing on a flat, bare rock, with only the four winds about us and the heavens above us. One of our young guides planted a Union Jack; and we realized that a virgin peak was conquered—Garibaldi.

The view from that point ten thousand feet above the sea must be left to the imagination of those who have been in like places. A cairn was built, and then

we hurriedly roped, for there were only four hours till nightfall and it had taken eight to make the ascent. Clouds were whirling about us now, and a storm was evidently coming on.

How we made the nerve-racking descent of that *arête,* and how once the front of our line went into one of those crevasses and was rescued, cannot be related here. Let it suffice that after a mad race with night and fog over the glaciers, we returned to camp, exhausted. One more night, and the worst, was spent in that desert spot, for all the elements seemed running riot, and our firewood was used up. In the morning we bade farewell to our never-to-be-forgotten camp, and set off home by the route we had come. Observation Point was reached, and then began the long tedious descent to the Tsee-Ki canyons. It rained in torrents, we lost our way and got entangled in a maze of cliffs. Several of these we overcame by sliding down our ropes, finally reaching the Tsee-Ki; and at 5 o'clock we stood on the Squamish road and were soon safe in our log house again.

Wednesday, the eighth day out, broke as clear and bright as ever a day seen by man, and we set off early down the country road on a farm wagon. Quietly we drove through that lovely valley, among its farms with their peaceful green lands and happy faces; above, the blue sky with a fringe of snow peaks.

Ten miles brought us to the sea where the little steamer "Britannia" waited. Then we bade farewell to Squamish and her "White-headed Baldi," and were homeward-bound.

The next four hours were spent steaming down that grand old fiord, Howe Sound, and at sunset we entered Vancouver harbor.

A DAY ON SIR DONALD.

By Frank W. Freeborn.

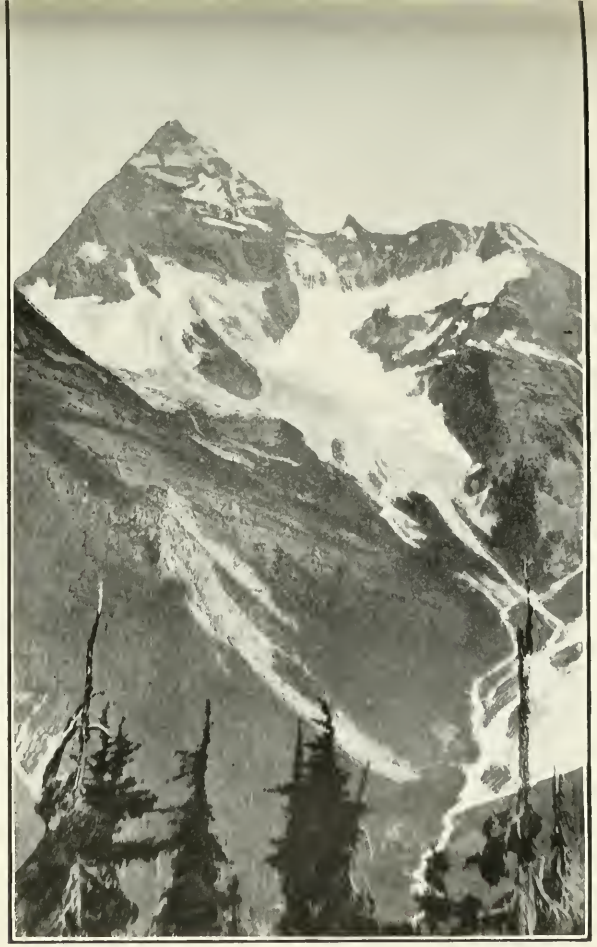
Sir Donald, one of the most conspicuous of the Selkirks by its height and position, rises at the side of the little valley in which stands the Glacier House. On its left it is buttressed by four noble peaks, and on its right the big Illecillewaet Glacier comes tumbling down four thousand feet, a mighty cataract of ice, a mile wide. Its sharp pyramid, rising to the height of 10,808 feet, is so steep that little snow can rest on its surface, but in its lap it holds a living glacier. In actual height it is overtopped by some mountains that are oftener climbed, but in elevation above any convenient starting point it considerably surpasses them. Add to this fact its excessive steepness, the difficulty of crossing its bergschund, and the danger from falling rock, and you have the explanation of the infrequency of its ascent. Only two ascents were made, I think, in 1905, and after the first in 1906 the guides were very loath to try it again that season. So when I reached Glacier House near the end of July, 1907, after a week in Paradise Valley with the Alpine Club of Canada, I had little hope of realizing my ambition to climb it. But when I hailed the elder Feuz on the subject he at once consented to try it with me. At the same time Miss Jean Parker, of Winnipeg, one of the practiced climbers of the Canadian Alpine Club, engaged the younger Feuz to go with her. So we fixed an early day for the climb, July 26th. The day before was an ideal one for the task, and we wished we had chosen it. But when at 3.30 o'clock the next morning we four met for an early breakfast, the clouds

hid all the mountain tops, and the prospect was gloomy. But at 4 o'clock we set out, hoping the adverse weather might change with the rising sun.

It was a silent, wet, chilly tramp that we four had by the early light up the Illecillewaet path for a half hour; then we branched off into a narrow trail to the left through dripping weeds and bushes, across two streams, uncomfortably wide and full even at that hour, and up a wooded ridge that led us to the terminal moraine of the Vaux Glacier. Here we found conditions of ascent better than usual. The crevasses were safely filled with hardened snow, and when the glacier became much steeper, the snow gave us a fine footing to kick our steps in it and make it our stairway. With this advantage we came at 7.45 to the *bergschrund*. This had always been one of the most serious obstacles to the ascent; but, thanks to the enormous masses of snow that had fallen the previous season and until early summer, the dreaded chasm was, when we happened to reach it, no chasm at all, and we could walk directly up to the cliff that forms the head wall of the glacier basin. Up this we swarmed with much use of our arms. The foot-holds and hand-holds were small, but generally more secure than in the Rockies. Two hundred feet up we came to a series of horizontal ledges none too wide, but wide enough for our purpose. These we followed straight across the face of the wall to the left until we reached the main mass of the mountain. Along this part of the way we had some encouraging weather promises; patches of blue sky appeared, and once for a few minutes the whole pinnacle of Sir Donald was free from clouds. How huge it towered in that sudden nearer exhibition!

Arrived at the end of this ledge, we stopped for twenty minutes for our breakfast. Then we tackled a narrow gully, one of the bugbears of the ascent, for it is the pathway of much falling rock. And so with anxious upward glances, and hurrying feet, we got through it as

F. W. Freeborn, Photo
MISS PARKER CLIMBING MT. SIR DONALD



F. W. Freeborn, Photo
MT. SIR DONALD

soon as we could, and halted for rest and breath, crouched at the foot of an overhanging cliff that rose vertically hundreds of feet above us, its face from top to bottom so jagged and loose-jointed, with such fresh-looking cleavage, that it threatened at any moment to drop tons of wreckage at our feet. The weather had grown thick again, streams of leakage were trickling down upon us, and so we kept our refuge no longer than we really had to.

Just beyond this halt we struck to the right and somewhat upwards over the face of the main peak; at first across a shallow *couloir* 200 feet wide, plainly in most of its curving width a pathway of rocky débris, where watchful eyes and active feet were needed. Beyond this a traverse was made of a rather steep snow slope. We were still two parties, and so we took the *couloir* and the traverse separately, Miss Parker and young Feuz going first, and then when they had got well started on the snow, the elder Feuz and I followed rapidly. Luckily, neither in this *couloir* nor in the one below had we to dodge so much as a pebble. In this we fared much better than some of our predecessors.

Our course lay towards the conspicuous shoulder on the right of the mountain, and thence along the sky-line to the top. The climbing was steady and slow and always somewhat strenuous, but in two and a half hours from our refuge under the cliffs, we came suddenly and somewhat unexpectedly upon the summit.

Miss Parker was the first Canadian woman to tread that windy peak. Only four women had preceded her, Mrs. Berens, Miss Benham and Miss Tuzo of Old England, and Miss Raymond of New England, all four names well known to the mountain-climbing world.

We were almost exactly eight hours in going from the Glacier House to the summit. We had been shut in by clouds and snow squalls for some time, and in a continuance of such condition with no view beyond a few

rods, we sat there and ate our lunch. It was a cold eating place; no sun to cheer us, no landscape to repay the toilsome climb, a cold wind blowing, our benumbed feet in a snow-bank, the flakes falling thickly over us. Then we came down.

The weather played us many tricks on the return, sunshine, rain, hail, sleet, fierce winds, snow squalls, in turn and sometimes in conjunction, gave us all the variety we needed to kill monotony. A little way below the summit the clouds blew away from about us and discovered a wide landscape to the east and south. Still farther down the whole mass of clouds would lift at times and we could look under them over the broad Illecillewaet Névé with its ten square miles of pure white, looking from that height as level as a floor. Now and then beyond appeared the mighty mass of Dawson, and further to the right the graceful curves of the Asulkan Pass and Glacier, with a wilderness of nameless ice-clad giants in the west beyond them as far as eye could see.

The most striking sight of all was a brief view that came to us when we were near the base of the main peak. We had just been pelted with a fierce squall of wind and rain and hail. It passed, and we stood in an oasis of sunlight. The lower clouds were gone. To the south a broad band of sunlight lay across the Illecillewaet Névé; the heavy blanket of the upper clouds threw its gloomy shadow on all the world in that quarter save the single peak of Mt. Purity, its perfect cone a brilliant gleaming white in the bright sunlight that transfigured it alone. I tried to catch the scene with my camera, but the result is only a faint suggestion of the majesty and beauty of the original.

Our descent was made by practically the same route as the ascent, but greater caution was necessary for safety; and so we all four went upon one rope. So carefully had we to pick our way, that even with less stops than on the way up, we were more than an hour

longer in descending from the summit to the glacier than in covering the same space in the ascent. But once on the glacier, we could avail ourselves of the same tactics that had served us so well on the peaks and passes about Paradise Valley; now rushing down in the yielding snow by leaps and bounds, now sitting and taking a long glissade. So with alternate sliding and striding we soon reached the moraine. Then, with a short but heavy shower, the cantankerous god of the weather gave us his parting blessing, and we plodded prosaically along until, in a trifle over seven hours after leaving the summit, we were back at the welcome shelter of the Glacier House. Tired? Of course. Exhausted? By no means. Happy? Only those who hold in memory the retrospect of such a day can know the feeling.

EXPEDITION TO LAKE O'HARA.

By R. L. Glisan.

To a nature-lover, the invitation of the Alpine Club of Canada to the Mazamas to send a representative to the Annual Meet in the summer of 1907 was very alluring with its brief hints of the scenery one might expect in and around Paradise Valley. And especially attractive was its suggestion of a two-days' expedition among glaciers and over passes in the vicinity.

I had years before looked with longing eyes from the train as we caught fleeting glimpses of distant snow-peaks and deep glacier-cut valleys, and when the call came to me in Oregon to penetrate the mysteries of the Rockies I eagerly accepted.

Oregon and Washington have attractive snow scenery, but it is largely centred about individual volcanic peaks rising like sentinels above the densely wooded region around them. I had made the ascent of our more prominent peaks, and was anxious to make comparisons. Entering Paradise Valley a stranger, I left it with so many pleasant memories that, as I now mentally retrace my steps and glance again at the photographs before me, as I have so many times, I experience a keen pleasure that only Alpine enthusiasts can possibly appreciate.

Paradise Valley is well named, for it lies in the center of a wonderful scenic region and makes an ideal place for a club camp. From the summit of Mount Temple above the valley, I gazed over a bewildering sea of snow peaks and looked with envious eyes in the direction of Lake O'Hara, eager to make the circuit of the lakes. That evening I entered my name for the O'Hara Expedition, and the following morning, rising

with the sun or shortly thereafter, made one of a small group around the fire, for the early air was sharp and biting.

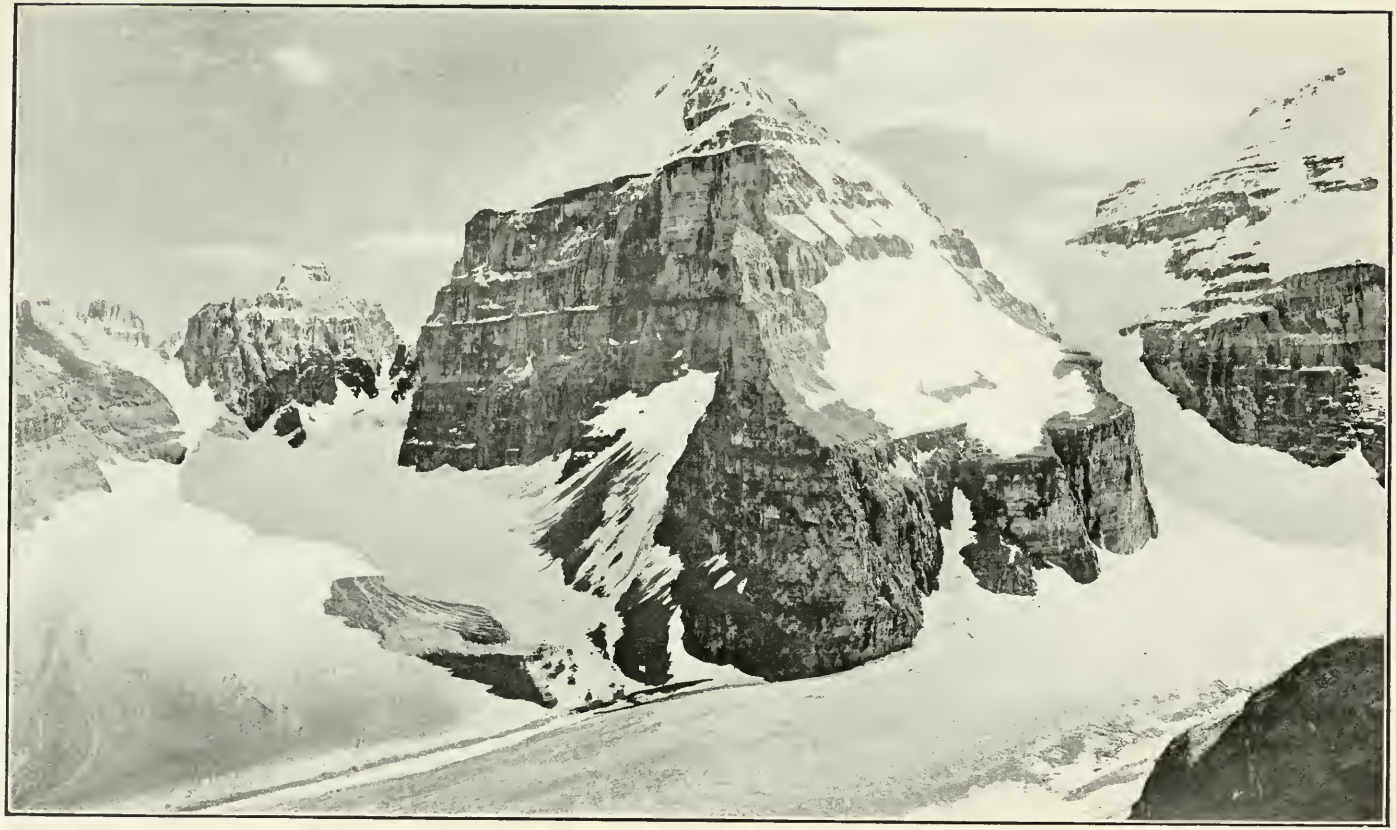
Breakfast over, seven responded to the roll-call and the click of the alpenstock announced our departure from camp. We trailed along up the timbered valley on the left bank of the stream rushing madly down from Horseshoe Glacier. Crossing the stream about a mile from camp, just above the Giant's Stairway, over which the water glides in liquid sheets, we came close to the Mitre, a prominent peak overhanging the valley, and so named from its resemblance to a bishop's mitre. Here we commenced our ascent towards the pass between the Mitre and Mt. Aberdeen, working up a rocky slide, of which the lower portion was covered with small brush. We were soon taking a breather on the first bench above, where the snow began. As a matter of practice and precaution the rope was uncoiled, and, while our leader was making the necessary loops, we turned and absorbed the view. Paradise Valley lay before us, a carpet of green, walled in by snow peaks reaching from the glacial amphitheatre at its head down its entire length. Mount Temple raised its snowy dome across the way, with Pinnacle, Eiffel and the other peaks forming a massive semi-circle curving towards where we stood.

The loops adjusted, we started the climb over the snow, and after a rather strenuous pull made the pass and looked down the other slope, which led to Lefroy Glacier and proved much steeper than the route up. Some difficulty had been experienced here on the previous expedition, as the snow then had a hard crust, necessitating a tedious process of step-cutting. We were fortunate, however, as we found the snow in good condition, and, going cautiously at the start, we soon broke rank and slid—first one ahead and then another—until what appeared like a forbidding descent was soon over and we were out on the glacier.

Where Lefroy and Victoria Glaciers meet we found the surface badly broken, necessitating rather cautious movement and obliging us in places to jump over partially concealed crevasses. Here we paused to take in the view. We were at the head of another valley, wilder and more interesting than Paradise. The Mitre and Lefroy looked down on us, as their other sides did on Paradise Valley. Victoria formed the centre of the circle, its huge mass of snow and ice overhanging high rocky walls suggesting something familiar. Turning, the eye swept down the valley of ice and there below us, a pure gem in a perfect setting, appeared a small lake of liquid blue. "Lake Louise!" someone exclaimed; and, like a flash, I then recalled gazing through powerful binoculars towards Lefroy and Victoria from the Chalet by the lake, wondering at the time if I would have the good fortune to stand where we now stood. The Chalet was plainly visible, and beyond we could see Laggan, the railroad and other signs of prosaic existence.

Awakened from a reverie by the warning that we must make Abbot Pass before the sun should loosen the dangerous snow masses by its piercing rays, we reluctantly turned, and taking our way around the bulwark of Lefroy, looked up the Victoria Glacier to Abbot Pass. The precipitious walls of Lefroy and Victoria on either side force snow into this narrow gap.

A clear blue canopy of sky brought out the vivid whiteness of the pass, and the incline of the vision following the upward slope belittled the intervening distance and made the pass seem almost insignificant. Why was it called the "Death Trap"? Why was it dangerous? Why the warning to take a long breath and no halt? The answers came as we pushed upward, the pass apparently receding as we advanced and yet near enough to lure us on. As we zigzagged up, huge masses of snow lay in loosely piled heaps, rising high above us, almost forbidding a whisper lest it start an avalanche; and the sun,



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MOUNT LEFROY AND VICTORIA GLACIER

as if just aware of our presence and indignant at our audacity, directed its rays against the gap. It did not start the snow, but it started beads of honest toil. A snow flurry in camp and the biting air on Temple had inspired me with the precaution of extra heavy clothing, and before we made the skyline, I was ready to halt and take my chances with an avalanche.

It seems a misnomer to call the gap between Lefroy and Victoria a pass. Higher than the average snow peak, a precipitious slope on either side, we stood on the knife-edge of the pass, caught our breath and lost it again as we gazed down the other slope. We looked into chaotic grandeur, snow and rock everywhere in an endless uplift. Reluctantly we commenced the descent, fortune again favoring us as the slope in places permitted cautious sliding, and before we realized it we were down the narrow funnel and on the ridge that jutted out from the main wall. Here someone suggested lunch, and the suggestion meeting with favor, we selected a place where we could take in the view and enjoy a sun-bath as well. The rocks, though a rather hard resting place, were a welcome relief from the snow, lack of water being the only drawback. Above us towered Lefroy, further to the left rose Mt. Yukness, and below, at the base of glaciers and snow-fields, we could see Lake Oeesa,* its ice-covered surface making the water seem black by contrast. The lake is seldom free from ice on account of its elevation.

After a brief rest and the inner man appeased, we made our way down the ledges and then down a talus or rock-slide above Oeesa. Here we caught a glimpse of Lake O'Hara in the valley below. Following down the bed of the valley for several miles, we suddenly came out on the rim of a rock-wall and below us saw the lake, its mirror-like surface reflecting the snow peaks surrounding it.

* Indian word meaning "Ice."

The lake is about a mile long, of irregular shape, in places half a mile wide, the further shore broken in a series of inviting coves covered with evergreen trees reaching to the water's edge. To our right Wiwaxy Peaks, a huge buttress of oddly-shaped rock pinnacles, rose abruptly from the water, cutting off the further end from view, while across rose Mount Schaffer. It was then about three o'clock, and the afternoon light brought out the vivid blue of the water. Not a trace of human presence, not a trace of any disturbing element, the whole scene was the personification of majestic peace.

The Alpine Club had established a temporary camp on the shore of the lake to take care of parties making the circuit from the main camp, the tents and supplies being packed in over a trail from Hector. We looked for the camp but failed to locate it, as it was hidden in one of the distant coves. Hesitating to break the stillness, we finally hallooed, the call echoing and re-echoing from shore to shore, but no one answered. We were puzzled at first how to reach the lake as the descent was almost a sheer drop of several hundred feet, but after careful experimenting, a route was selected requiring caution, and we were soon at the water's edge.

Satisfying our thirst from a small torrent of pure water, we followed the left shore over a mossy bank, through a natural park, and came in sight of the camp about three-quarters of the way down the lake, a most welcome sight. A refreshing plunge in the water gave additional zest to our appetite for the evening meal, which soon followed. The air was cool enough to make the fire welcome, and the hard tramp, bath and supper had put us in a condition of blissful laziness. Lounging there we could see the evening glow and the deepening shadows on the lake, and on the mountains and glaciers beyond. Going up to a meadow about a mile distant, we secured the full effect of the afterglow on the snow peaks back of the camp. The twilight was gracious in its length,

M. F. Bridgland, Photo

LAKE O'HARA

THE EAGLE'S EYRIE

PROSPECTOR'S VALLEY

and only the thought of tomorrow persuaded us to turn in. A tent with double blanket on yielding, fragrant boughs seemed luxurious. We fastened the lower flap to keep out the porcupines who have a playful habit of chewing footgear and driving, the quill, to one's dismay, when interfered with.

After a restful sleep, which you often fail to get in city turmoil, we arose as Aurora, rosy-fingered dawn, was tinting the rocks and glaciers in soft morning light. Breakfast over, we continued our circuit. Above the timber-line we stopped at Crystal Cave to secure specimens and a farewell view of the lake. Like Lot's wife, we could not resist glancing back for just one more view to salt down in our memory. Opabin Pass was the first goal, and on our way up, on the benches above, we passed two small lakes covered with floating ice. In skirting them we sank repeatedly in the loose snow, making slow progress. From above the lakes, looking westward, a panorama of mountain scenery was presented, broader and more extensive than we had enjoyed at Lake O'Hara. In the distance we could see Mount Odaray prominent among many other peaks. Light clouds in the clear blue sky heightened the effect. Opabin Pass lacked the elements of danger and the strenuousness of Abbot Pass. A good long pull over the pass and a slide and coast on the other side brought us down the slope below the snow-field; and on a rocky, heather-covered knob, where we could shake the snow from our feet, and bask in the sunshine, we ate lunch, with plenty of sparkling water and a glorious view to feast on. Just below us stood the Rock Tower, a curious monolith rising above the bed of the valley. Keeping to the left, we worked along the side of the valley a short distance until we reached the rock-slide below Wenkchemna Pass. Struggling up over small loose rock and then stepping on larger boulders, we reached snow-line, the sun a blaze of glory at our backs, reflecting the heat from snow and

rock into our faces. A gentle breeze on the summit of the pass proved very welcome. We were now looking down the Valley of the Ten Peaks, ten snow peaks forming the right side of the valley.

From the lofty mountains of Oregon and Washington, the view lies all below, no rival near. From these different passes peaks lifting everywhere fairly bewilder one; and it makes it all the more impressive to realize that you are not far from the Great Divide, the source or fountainhead from which streams branch out to flow eventually into three different oceans. The descent into the valley would have been easy had the snow been firmer . We broke through repeatedly, sometimes waist deep. Three of our party soon left us to keep on down to Moraine Lake, a few miles away, where another side camp had been established. We ascended the left slope of the valley, and after a rather steep rock climb reached snow again and quickly made Wastash Pass, just west of Eiffel Peak, and looked into Paradise Valley.

We were now opposite the Mitre Pass, the first pass of the preceding day's tramp. We hurried down, enjoying several steep slides in the snow, and were soon retracing our way down the valley, making the main camp in time for supper; having seen more in two days than could be seen elsewhere in months, an expedition never to be forgotten.

P. D. McTavish, Photo

OPABIN PASS—LOOKING SOUTH-EAST
PASS NO. 3 OF TWO-DAY EXPEDITION

C. C. Glisan, Photo

WENKCHEMNA PASS—LOOKING EAST
PASS NO. 4 OF TWO-DAY EXPEDITION

NATURA BENIGNA.

(From "The Coming of Love.")

What power is this? What witchery wins my feet
To peaks so sheer they scorn the cloaking snow,
All silent as the emerald gulfs below,
Down whose ice-walls the wings of twilight beat?
What thrill of earth and heaven—most wild, most sweet—
What answering pulse that all the senses know
Comes leaping from the ruddy eastern glow
Where, far away, the skies and mountains meet?
Mother, 'tis I reborn: I know thee well:
That throb I know and all it prophesies,
O Mother and Queen, beneath the olden spell
Of silence, gazing from thy hills and skies!
Dumb Mother, struggling with thy years to tell
The secret at thy heart through helpless eyes.

—Theodore Watts-Dunton.

SCIENTIFIC SECTION.

THE CAUSES OF MOUNTAIN FORMS IN THE CANADIAN ROCKIES.

By A. P. Coleman.

The "Everlasing Hills" have become proverbial, so that we are apt to think of mountains as the very emblems of stability and permanence, and very few except geologists ever inquire into their past to see how they were lifted up and sculptured to their present shape, or look into the future to forecast their ultimate fate. There is nothing more certain, however, than the fact that mountains, like every other creature of earth, have their birth, their youth, and middle age, and at last sink into decrepitude. The loftiest mountains must always be geologically young, for, once elevated, every century means wear and tear and loss, till finally only stumps remain, as in the most ancient ranges of America, the Laurentide Mountains of northeastern Canada.

The raising of mountains is a difficult bit of engineering to explain, and geologists are by no means agreed as to the causes that thrust one part of the earth's crust skyward and sink other parts into ocean depths. The most commonly accepted cause is the shrinkage of the earth's interior, by cooling, or by the loss of gases, or by condensation due to gravity. In this process the solid outer crust becomes too large for the interior and must be crushed and crumpled to adjust itself. This crushing and crumpling takes place along the lines of weakness, usually where sea and land meet, as in our Pacific coast region. There, from time to time, through the geologic ages the ocean floor has pushed itself inland, thrusting up the parallel ranges of British Columbia and Alberta, the Selkirks first and the Rocky Mountains last.

It was not until the end of Mesozoic times, when the dawn of the recent ages had begun, that the Rockies were elevated. No volcanic forces took part in the work. All the rocks that compose them were laid down as sediment on a sea bottom, mud and sand and gravel and the lime of shells accumulating until the beds were five miles or more in thickness and were slowly transformed into slate and quartzite and conglomerate and limestone, the building materials of the mountains that were to be.

What gave the signal for the raising of the new range no one knows, but after the Cretaceous sediments forming the coal-bearing rocks of the prairie provinces had been deposited, the thrust from the Pacific became irresistible, the earth's crust yielded and step by step the thick layers of rock were pushed inwards, rising as folds or breaking off strip by strip, tilted up and riding upon one another like ice-cakes when a great floe is driven ashore. We must not think of this process as taking place suddenly in one mighty convulsion, but very deliberately, a small push with its earthquake shock, followed by a long quiescence before the next instalment of elevation; so that age by age the mountains grew, perhaps are growing even yet.

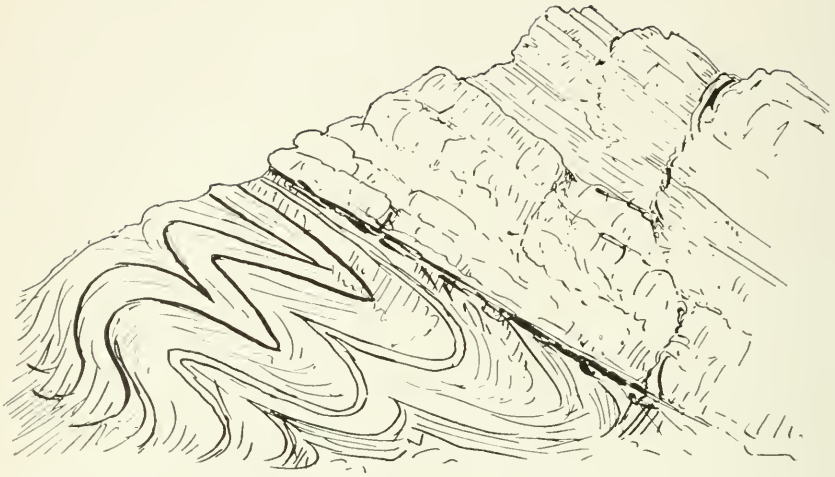
During all this time of slow growth in height the destructive forces were at work, frost and weather and running water and ice, tearing down the structures just as they do now, though the constructive forces were more than a match for them, at least in the earlier history of the mountains. The present forms of the Rockies are due then to a balance between the upbuilding and the down-tearing influences which have been at work during the past millions of years since the end of Cretaceous times.

Having discussed general causes shaping the mountains, let us turn now to some of the special features. The fundamental structure of the Rockies is simple when

contrasted with the complex foldings and faultings in different directions shown by the Alps. The folds in our mountains are often rather broad and uncomplicated, especially toward the Pacific side of the range; while toward the northeast vast blocks of the sediments. 25 to 40 miles long, from nothwest to southeast, several miles wide and sometimes more than 15,000 feet thick, seem to have been split off from the earth's crust, the southwest side being tipped down, and the northeast side slid up over the next block toward the prairies, the last block riding seven miles out over the region of the foothills before the thrust from behind ceased. Mr. McConnell, of the Geological Survey, whose work I am following here, estimated that along Bow Pass this overriding or telescoping of range after range sums up to a shrinkage of 25 miles. If the blocks were set back in their place again and the strata ironed out flat Golden would be 25 miles farther from Calgary than now.

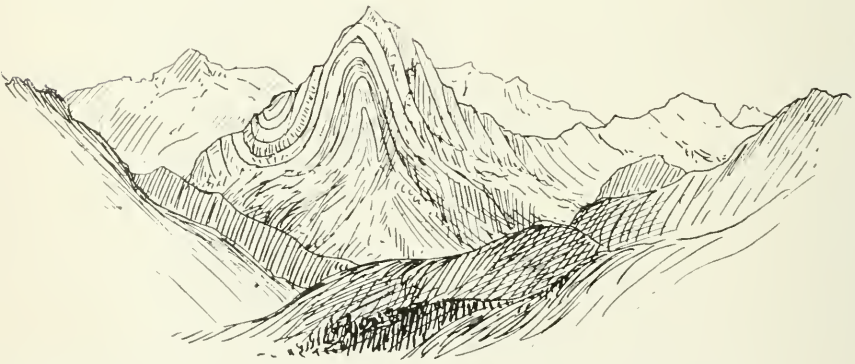
The blocks which build the eastern ranges have various tilts. In the Brazeau Valley I found the inclinations run from 28° to about 50°, blocks with the lower dip presenting a steep cliff of 3,000 or 4,000 feet toward the northeast, and a gentler slope following the surface of the strata, toward the southwest. These rather gently tilted blocks provide the "writing-desk" type of mountain so common in the eastern Rockies, *e.g.*, near Banff, rather scorned by certain English mountain climbers. The steeper blocks, with a dip of 50° or more, make very rugged, striking mountains, however, often with two or three more resistant layers of quartzite standing out as sharp ridges, while the softer slates have been carved away by the weather.

The great faults that separate block from block sometimes run out into sharp folds at one end, as in Sentinel Mountain, near the Kootenay Plains on the Saskatchewan.



A. P. Coleman, Sketch

FOLDING UNDER THRUST FAULT, CLEARWATER RIVER



A. P. Coleman Sketch

ANTICLINE AND SYNCLINE, SENTINEL MT., KOOTENAY PLAINS

Towards the middle of the Rockies the tilted blocks of the eastern side give place to broad folds, more or less dome shaped at times, where there are wide anticlines; while at others the anticlines have been destroyed and shallow synclinal forms make the mountain tops. Here the carving of the rivers, perhaps helped by faults in some places, has cut the nearly flat-lying beds into castles, minsters and cathedrals, magnificent types of architecture, with towers and unscalable walls, supported here and there by mighty buttresses.

The folding is not always on broad lines with domes and gentle synclines, however; for sometimes, as on Kananaskis Pass, the folds have been pushed so far as to be overturned and lie flat on their side, to be carved up in various ways by frost and running water. Along with predominant folding, faulting occurred also in many places, splitting up the folded structures into large or small fragments. On the other hand when the great fault blocks of the eastern side of the range rode upon the next block to the east the softer strata beneath were often crumpled into small folds, as may be seen along the Clearwater Valley. In the eastern half of the Rockies we have then chiefly fault blocks with minor folds, and in the western half chiefly broad folds with faults of a less important kind.

All of the fundamental structures described are supposed to be due to thrusting from the direction of the Pacific, thus furnishing the rough and massive forms from which were to be carved the splendid variety of slopes and cliffs and ridges and pinnacles that give the mountains their present wild variety of surface. Above the snow-line the sculptors which shaped them are chiefly frost, the avalanche and the glacier; on the lower slopes frost and rain and torrents have done most of the work; while the larger rivers have sawn their way down through the rocks, hollowing canyons and broad valleys, and sweeping downwards toward the plains or the sea

all the debris, the rocks and pebbles, the sand and the clay, delivered to them by the agents working at higher levels. The main valleys have generally been cut right across the direction of the great ranges, as shown by the Bow, the Saskatchewan and the Brazeau on the east, and the Kicking Horse on the west.

Were the rivers there before the mountains, and did they carve their valleys downwards as fast as the upheaving forces pushed the mountains aloft; or did great lines of faulting provide channels that the rivers merely had to deepen? I am inclined to think that the main rivers at least were earlier than the mountain ranges and simply held their ground during the ages of uplift.

Passing through the Rockies by the lower valleys as in the Kicking Horse Pass, one sees mainly the work of running water. Where the river has a somewhat gentle slope, like the Bow, the valley which it has cut is broad and open, with terraces on each side sweeping with a curve up to the foot of the cliffs, which have their bases buried under vast heaps of talus blocks from above, mainly quarried by frost. The broad valleys seem peaceful enough, and it is hard to imagine the relentless war of the river and its tributary torrents upon the mountains until one works out the cross-section which they have cut from the summits on one side to those on the other, and figures the many cubic miles of rock which have been destroyed and carried down to the plains by the flow of water.

Where the slopes are steeper we have turbulent rivers, like the Kicking Horse, rapidly cutting down their V-shaped valleys into canyons, and our sense of the endless strife grows more vivid as we watch them leaping down thousands of feet in a few miles, dragging with them the rocks which have rolled from the sides and using them as powerful tools to cut the canyon still deeper.

As one climbs out of the main valleys, especially on the western side of the Rockies, when timber-line is passed, snow begins to show itself, and at length there are snow-fields draining into glaciers, which creep thousands of feet down into the valleys. Finally the warmth of the lower elevation balances their slow advance and from an ice cave at the end there flows a milky mountain torrent, loaded with the stones and gravel and rock flour ground from the rock floor of the glacier above. Here there is a splendid chance to study the carving power of ice in its downward motion urged by gravity. Where the mountain torrent cuts sharp-walled canyons or V-shaped gorges, the glacier carves broad U-shaped valleys with smoothly rounded surfaces; and one notices that these broad U valleys often run far below the present glacier and are crossed by crescent-shaped moraines, perhaps now tree-covered, mounments of former ice extension. In general our glaciers seem to be retreating as if the warming up of the climate after the Ice Age were still slowly going on.

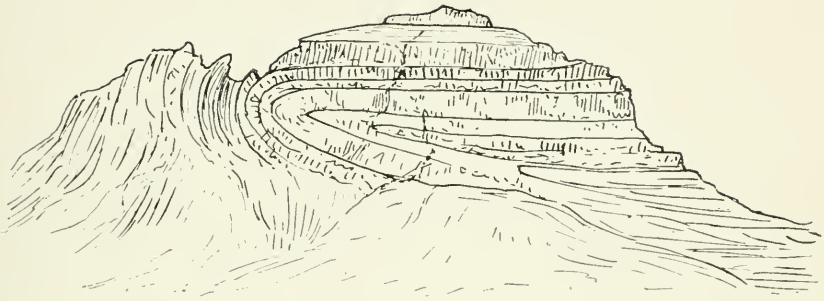
In many cases the old ice-carved valleys have been hollowed into rock basins or have their outlet blocked by moraines; and this gives rise to some of our most delightful mountain scenery, where forest slopes and precipices and snow-fields are reflected in lakes of the most marvellous turquoise blue in deeper parts, running into clear green in the shallows. These ravishing colors appear to be due to the last remnants of glacial mud from the ice-fed streams flowing into the lakes, the finest possible particles settling almost infinitely slowly, and reflecting the short blue rays of light, just as infinitessimal particles in the air give the paler blue to the sky. The intense blue or green of these mountain lakes contrasts strongly with the much paler blue of clear lakes like Superior or Ontario,, unfed with glacial mud, and makes it certain that the minute remaining particles are the real cause of the color.

Rising out of the snow-fields and rock ridges and isolated peaks, *nunataks,* as they are called in Greenland, and as one ascends above the glaciers a new type of scenery shows itself, no longer smoothed and rounded surfaces of rock with here and there a moraine, but rugged forms where weathering and frost have rudely done the shaping. In this higher region the character of the rock has much to do with its forms. Hard quartzite or solid limestone resist best and stand out as cliffs and ridges, while softer slates and sandstones crumble and slide, giving long slopes of loose scree into which the foot sinks, the whole surface often slipping with the climber.

In these upper regions the jointage of the rocks plays a large part, those with numerous joints, into which the water from thawing snow may sink by day, only to freeze at night and pry asunder the blocks, are quickly shattered even if of hard materials; while rocks with few open fissures stand their ground far better and rise amidst the slopes of debris as walls or pinnacles.

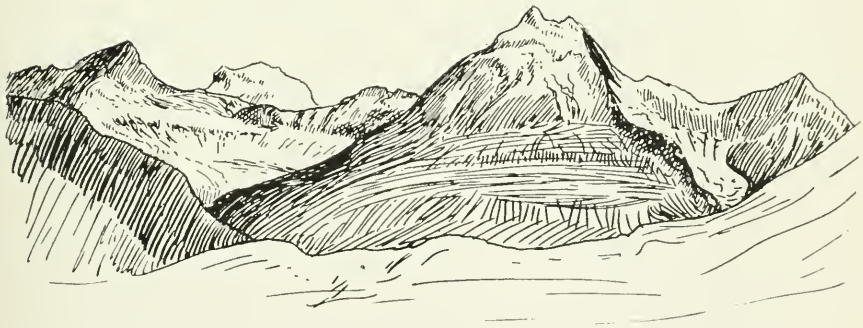
From the higher levels one sees, too, how the glaciers eat back their U-shaped valleys into the solid rocks of the central mountain blocks, even little "cliff glaciers" carving for themselves nests shaped like a half kettle, *cirques,* as they are called in the Alps. When two of these *cirques* have been gnawed inwards toward each other very narrow ridges of rock with knife edges may result. From the lips of empty *cirques* or hanging valleys hollowed during the Ice Age bridal-veil falls now spring hundreds or thousands of feet over precipices into some deeply cut main valley carved by a glacier of the first rank.

The highest of our Rockies were probably never covered by the ice sheets of the glacial period, but rose above them, so that their rugged forms are due to the tilt of the strata, their relative resistance to weathering, and their lack of joints in which frost could work.



A. P. Coleman, Sketch

OVERTURNED FOLD, CLEARWATER RIVER



A. P. Coleman, Sketch

CIRQUES, HEAD OF SOUTH FORK, BRAZEAU RIVER

Every climber must have been impressed by the strangely uniform level reached by most of the peaks. Hundreds or even thousands of summits rise from ten to twelve thousand feet above the sea, but very few get above that limit. Some geologists account for this by supposing that a vast tableland has been elevated and then carved into the innumerable crests and valleys; but it is very doubtful if such a tableland ever existed. Certainly no important remnant of it can be recognized now. It seems more probable that the higher summits, rising with steep slopes much above the protecting snowfields, have been more rapidly attacked by frost and storms, and so have paid the penalty of greatness. The higher the summit the more rapidly it is cut down, till it reaches a level where slopes are gentler and snow and ice give some protection from erosion; and so there is a tendency to uniformity of height.

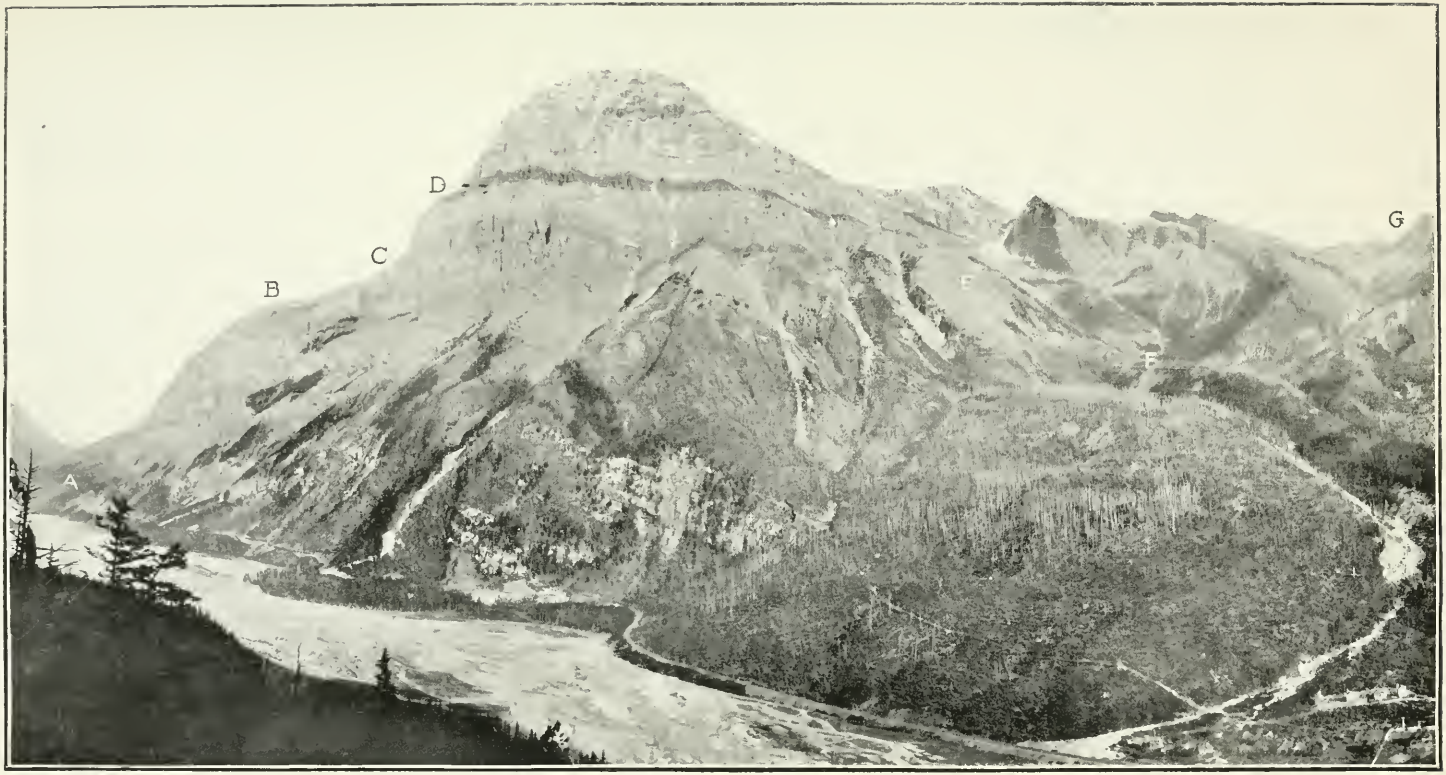
One type of mountain scenery is lacking in our Rockies. No eruptive rocks have reached the surface in their elevation, so that none of the forms belonging to massive rocks can be seen.

From the comparative simplicity of their structure our Rockies make a splendid school for the study of folds and faults on a large scale, and it is well worth while for the members of our Club to add this geological interest to the many other attractions of the mountains.

MOUNT STEPHEN ROCKS AND FOSSILS.

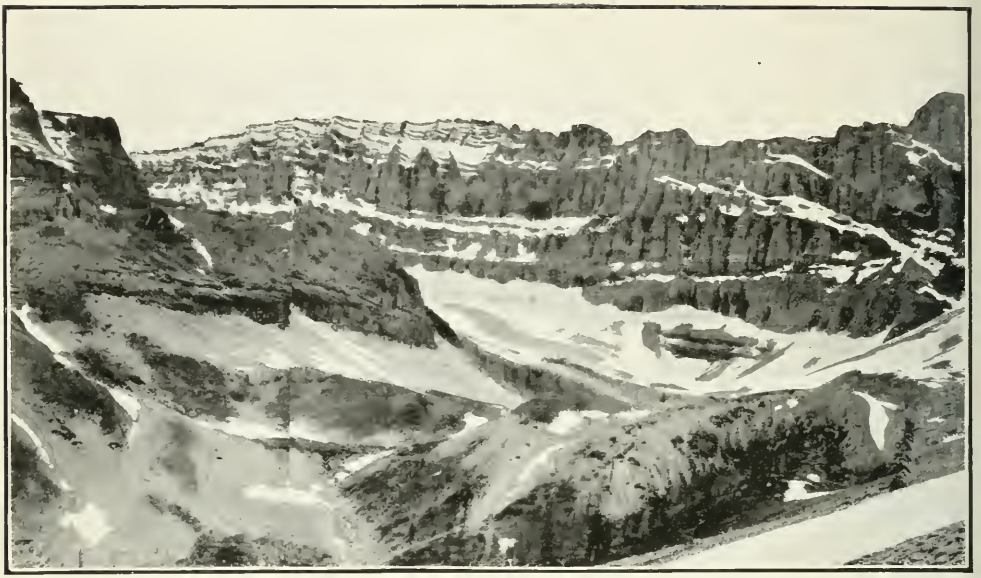
By Charles D. Walcott.

The north face and slope of Mount Stephen presents a wonderfully interesting section of rocks in which many finely preserved fossils occur. At the base, where the railroad passes through the north shoulder of the mountain mass, fossils of the Lower Cambrian fauna occur in the hard, brown sandstones and in the bluish-gray limestones and shales above them for 315 feet. The characteristic fossil of this horizon is a large trilobite called *Olenellus*. No whole ones have been found on Mount Stephen, but an entire specimen found at about the same place in the section in Nevada is shown by Figure 1, Plate II. Above the Lower Cambrian formations comes the massive Cathedral limestone, 1680 feet thick, which forms the summits of Cathedral Mountain. These limestones are sandy and impure and in Mount Stephen only worm borings have been seen in them. Above the Cathedral formation there is a series of thin layers of bluish limestone and shale, 525 feet thick, which is called the Stephen formation. In this may be found many fragments of fossils that belong to the Middle Cambrian fauna. We have now reached the level of the celebrated fossil bed of Mount Stephen. The rock is a gray, siliceous and sandy shale that, 2200 feet above the railroad station at Field, is 150 feet in thickness. A sharp fold in the shale and the rock below has bent the layers sharply down the slope in the direction of Field. The frost, rain and snow have gradually broken up the great layers of shale and scattered them down the slopes. Nature has done all that



Chas. D. Walcott, Photo

THE NORTH-WEST FACE OF MT. STEPHEN—SHOWING THE KICKING-HORSE RIVER AT THE BASE



Chas. D. Walcott, Photo

VIEW OF THE AMPHITHEATRE ON SOUTH-WEST SIDE OF MT. STEPHEN

Chas. D. Walcott, Photo

JUVENILE GEOLOGISTS AT THE "FOSSIL BED," MT. STEPHEN

she could to open up and make accessible the great storehouse of fossils contained in the shales. Nearly every fragment of shale found on the slopes from 2000 to 2600 feet above Field has fossils upon it; not only fragments, but usually entire specimens of trilobites. The fossil bed thins out rapidly to the northeast and southwest. It is in fact a lens-shaped formation, thinning out from the center in all directions. The shales were originally a sandy mud that was slowly deposited as thin layers in quiet water. For some unknown reason, the trilobites died by thousands and were buried by the successive layers of mud. Small marine shells occur quite abundantly in some of the layers along with the trilobites and smaller fossils of various kinds. The largest and most abundant trilobite is called *Ogygopsis klotzi,* and from it the name *Ogygopsis shale* is given to the band or lens of siliceous shale in which the trilobite occurs.

The Stephen formation, with the Ogygopsis shale, forms the dark, bluish-gray band that extends across the north face of the mountain just above the shoulder, over the railroad tunnel. Another dark band of limestone, 150 feet thick, that shows in all photographs of Mount Stephen from the north, is 650 feet higher up, the interval being occupied by massive beds of gray siliceous limestone. A few fragments of Middle Cambrian fossils occur in the dark, bluish-gray limestone. Above the dark band, massive beds of gray, sandy limestone rise tier above tier for 2700 feet to the summit of the mountain. This great series is called the *Eldon formation,* from Eldon, north of which, in the slopes of Castle Mountain, it has a fine development.

Southwest of Mount Stephen the layers of rock are broken and bent to the southwest and west until they pass beneath Mount Dennis. All belong to the Cambrian period. A few fossils occur in the amphitheatre east of Mount Dennis, but the best collecting

ground for fossils above the great fossil bed, Ogygopsis shale, is in the Mount Bosworth section on the continental divide.

The principal locality from which good fossils can readily be obtained is on the slope of Mount Stephen, above Field. The best way to make a collection from the "fossil bed" is to ride up the trail on a pony to about 2000 feet above the railroad, collect specimens, securely wrap them in paper, place them in a bag, tie the bag to the saddle, and lead the pony down the mountain. A fine lot can be secured in a long day's trip, 6 a.m. to 6 p.m.

In order that the reader may understand the location of the "fossil bed" and the position of the various formations in the Mount Stephen section, four photographs taken in 1907 and a geological section are given in connection with this paper; also a list of the fossils from the "fossil bed" and illustrations of the more common species.

No. 1. Northwest fact of Mount Stephen, showing the Kicking Horse River at the base.

A—The railroad tunnel.

B—The great north shoulder.

C—The lower bluish-black limestone belt.

D—The upper bluish limestone belt.

E—The celebrated "fossil bed."

F—Best locality to camp in working "fossil bed."

G—East slope of Mount Dennis.

No. 2. View looking northwest from the "fossil bed," which is shown in the foreground. The trail from Field can be followed with a saddle animal to the large dead pine tree on the left. Just below this is the ridge upon which the trail is located. To the left of the ridge

Chas. D. Walcott, Photo

VIEW LOOKING NORTH-WEST FROM THE "FOSSIL BED," WHICH IS SHOWN IN THE FOREGROUND

Chas. D. Walcott, Photo

VIEW LOOKING WEST FROM THE "FOSSIL BED" TOWARD MT. DENNIS

near the triangular patch of snow is the best place to camp when working at the "fossil bed." It is 1600 feet above Field.

This picture gives a beautiful view of the various channels of the Kicking Horse River, the mass of Mt. Burgess, and the Van Horne range to the left of Mt. Burgess.

No. 3. View looking west from the "fossil bed" toward Mt. Dennis. The character of the "fossil bed" is beautifully shown, also the structural character of Mt. Dennis.

No. 4. View of the amphitheatre on the southwest side of the upper portion of Mt. Stephen. The "alcove" erosion of the cliff on the south side of the amphitheatre is beautifully shown. Middle Cambrian fossils occur in the rock shown in the lower right hand corner of the view.

GEOLOGICAL SECTION OF MOUNT STEPHEN.

STUDIED JULY, 1907.

The section is from the summit of the mountain down the northeast and north slopes to the Canadian Pacific Railroad track below the tunnel and through the basal quartzitic sandstones.

The massive, siliceous, dolomitic limestone (*Eldon formation*) forming the upper portion of the mountain was not measured above the bluish-gray limestone and shaly band. Its thickness is estimated at 2,700+ feet. It is 2728 feet thick on Mount Bosworth. An attempt was made to measure the Cathedral formation, but owing to step-faulting, the result is not satisfactory. This formation has a thickness of 1595 feet on Mount Bos-

worth, so the measured and estimated thickness of 1680 feet on Mount Stephen is given in the section. No attempt was made to carry the section from Mount Stephen across to Mount Dennis through the Bosworth formation owing to local displacement and the alteration of the strata in Mount Dennis.

MIDDLE CAMBRIAN. (Summit of Mountain)

Eldon Formation—

1a. Massive bedded, gray, siliceous and dolomitic limestone, estimate ..... 2700 + ft.

1b. Bluish-gray limestone with bands of dark siliceous shale in lower portion ..... 190 ft.

Fauna—Middle Cambrian.

The fossils are very poorly preserved but the following have been recognized:

Protospongia (spicules)
Lingulella, species undetermined.
Hyolithes, species undetermined.
Agnostus, cf. montis Matthew.
Zacanthoides spinosus (Walcott)
Ptychoparia, species undetermined.
Bathyuriscus (pygidium)
Ogygopsis (pygidium)

1c. Gray arenaceous and dolomitic limestone ..... 650 ft.

Stephen Formation—

1. Calcareous and siliceous shales 150 ft.

This shale is given the name of *Ogygopsis shale* from the predominating trilobite contained in it, *Ogygopsis klotzi.* A detailed description of this

shale and its contained Middle Cambrian fauna may be found on page . In a siliceous shale about one-half mile east of the great fossil bed the following species were found:

Obolus mcconnelli (Walcott)
Nisusia (*Jamesella*) cf. *nautes* Walcott.
Hyolithes carinatus Matthew
Orthotheca, species undetermined.
Scenella varians Walcott.
Ptychoparia, species undetermined.

2. Thin bedded, bluish-black limestone forming dark broken cliff in many sections.....325 ft.

Fauna—Middle Cambrian.

In the upper portion of this formation just beneath the Ogygopsis shale in a bluish-black shaly limestone in the amphitheatre between Mount Stephen and Mount Dennis the following species of fossils were found:

Obolus mcconnelli (Walcott)
Acrotreta depressa Walcott.
Hyolithellus annulata (Matthew)
Ptychoparia, species undetermined.
Neolenus serratus (Rominger)
Ogygopsis klotzi (Rominger)

At another locality just east of the great "fossil bed" there were found in the limestone beneath the Ogygopsis shale the following species of fossils:

Micromitra, species undetermined.
Nisusia alberta Walcott.
Hyolithes, species undetermined.
Bathyuriscus rotundatus (Rominger)
Neolenus serratus (Rominger)

Near the base of this thin-bedded limestone the following species of fossils were found:

Micromitra, species undetermined.
Obolus mcconnelli (Walcott)
Micromitra (*Iphidella*) *pannula* (White)
Acrotreta (large)
Hyolithes, species undetermined.
Agnostus montis Matthew.
Agraulos, species undetermined.
Ptychoparia, species undetermined.
Zacanthoides, species undetermined.
Bathyuriscus, species undetermined.
Albertella, species undetermined.

2a. Massive bedded gray limestone, breaking down into thin layers on weathering ..... 37 ft.

3a. Gray and greenish siliceous shale 47 ft.

3b. Gray oolitic limestone in layers, 6 in. to 2 ft. thick..... 4 ft 6 in.

Fauna—Middle Cambrian.

Micromitra, species undetermined.
Nisusia alberta(?) Walcott.
Hyolithes, species undetermined.
Microdiscus, species undetermined.
Ptychoparia, species undetermined .

3c. Greenish siliceous shale..... 15 ft.

3d. Gray oolitic limestone..... 6 ft. 6 in.

3e. Gray, impure dolomitic limestone, compact, fine-grained and weathering buff and yellow... 38 ft.

3f. Greenish siliceous shale..... 1 ft.

3g. Similar to 3e..... 52 ft.

3h.	Gray oolitic limestone.....	2 ft. 2 in.
3i.	Similar to 3e.....	3 ft.
3j.	Gray oolitic limestone.....	4 ft. 2 in.
3k.	Similar to 3e.....	5 ft. 8 in.
3l.	Gray oolitic limestone.....	2 ft. 3 in.
3m.	Similar to 3e.....	5 ft.
3n.	Gray oolitic limestone.....	3 ft. 9 in.
3o.	Thin-bedded, bluish-grey limestone, weathering buff	10 ft.
	Total of 3	200 ft.

Cathedral Formation—

1. Massive bedded, arenaceous, siliceous limestone .....60 ft.

2. Massive bedded, arenaceous, siliceous dolomitic limestone. At 495 feet from the base the beds are thinner and of a dark gray color for 30 to 40 feet. At 825 feet the massive layers are banded with light and dark grey colors..1560 ft.

   Owing to small step faults the thickness of this series of strata is uncertain. The entire thickness on the northeast side was measured and an allowance made for duplication by faulting.

   This great limestone series forms bold, high cliffs on the east face of Mount Stephen and the west side of Cathedral Mountain.

Fauna—Annelid borings and trails at a few horizons.

3. Massive bedded arenaceous dolomitic limestone .....60 ft.

Total of Cathedral formation.....1680 ft.

LOWER CAMBRIAN—

Whyte Formation—

1. Thin-bedded bluish-black and gray limestone ..... 3 ft.

Fauna (from 1 and the interbedded limestones at the top of 2)

Nisusia (*Jamesella*) *lowi,* new species.
Stenotheca elongata Walcott var.
Platyceras, new species.
Scenella varians Walcott
Hyolithes billingsi Walcott
Ptychoparia, species a.
Crepicephalus, new species.
Protypus, new species.
Albertella, species undetermined.

2. Gray siliceous shale with interbedded gray fossiliferous limestone in layers 5 in. to 2 ft. thick in the upper portion .....108 ft.

Fauna (In the shale of the central portion)

Cystid plates.
Micromitra (*Paterina*), species undetermined
Acrotreta sagittalis taconica Walcott.
Nisusia (*Jamesella*) *lowi,* new species.

Hyolithes (fragment)
Hyolithellus cf. *micans* Billings
Scenella varians Walcott
Olenellus (fragments of thoracic segments)

3. Thin-bedded, compact, hard, dark, bluish-gray limestone, with a little interbedded gray, siliceous shale and a few beds of coarser gray limestone, 6 to 10 inches thick..52 ft.

Fauna (near the top)

Acrothele colleni, new species.
Acrotreta sagittalis taconica Walcott
Scenella varians Walcott
Stenotheca elongata Walcott var.
Albertella, species undetermined.
Olenellus (fragments).
Bathyuriscus, species undetermined.

Fauna (near the base)

Micromitra (*Paterina*) *labradorica* (Billings) var.
Micromitra (*Iphidella*) *pannula* (White)
Acrotreta sagittalis taconica Walcott
Bornemannia prima, new genus and new species
Ptychoparia, 3 species.

4. Brownish-gray, quartzitic sandstone in layers 2 to 4 inches thick 32 ft.

Fauna—
Microdiscus, species undetermined.
Olenellus (fragments).
Ptychoparia, species undetermined.
Protypus, species undetermined.

5. Gray, siliceous shale.....102 ft.

Fauna—

Hyolithes billingsi Walcott
Scenella varians Walcott
Ptychoparia, 2 species.

6. Bluish-black and gray limestone..18 ft.

Fauna—

Micromitra (*Iphidella*) *pannula* (White)
Acrotreta sagittalis taconica Walcott
Kutorgina cingulata Billings
Nisusia festinata Billings
Hyolithes billingsi Walcott.
Scenella varians Walcott
Protypus, new species.
Agraulos, species undetermined.
Ptychoparia, 3 species.
Olenellus canadensis, new species.

BOW RIVER TERRANE.

St. Piran Formation—

1. Massive bedded quartzitic sandstone .....300+ ft.

In the Lakes Agnes and Louise section the St. Piran formation has a thickness of 2640 feet.

Beneath the St. Piran the Lake Louise shale is 105 feet in thickness. In it occur a few fossils as follows:

Micromitra (*Iphidella*) *louise,* new species.

Cruziana (casts of tracks and burrows made in the mud by trilobites)

Beneath the Lake Louise shale there is a great thickness of quartzitic sandstone and siliceous shales of which about 600 feet of the upper portion is exposed at Lake Louise.

FAUNA OF THE GREAT FOSSIL BED.

(Ogygopsis Shale)

The fossils occur in a gray siliceous and arenaceo-calcareous shale, only a trace of calcareous matter showing. The shale usually rests on a thin-bedded limestone, but in one instance a lentile of quartzitic gray sandstone occurs between the lower limestone and the shale. This is at the upper northeast end of the exposure of the shales, and here several species of fossils occur that were not seen elsewhere, notably *Burlingia hectori* Walcott.

Fossils are very rare for 50 feet above the base of the shale and then only the more common species such as *Ogygopsis klotzi, Bathyuriscus rotundatus* and *Ptychoparia cordillerae.*

The list of named fossils from this shale is as follows:

1. *Hyolithellus flagellum* (Matthew)
2. *Hyolithellus annulata* (Matthew)
3. *Orthotheca corrugata* Matthew
4. *Orthotheca major,* new species.
5. *Hyolithes sp.*
6. *Hyolites carinatus* Matthew.
7. *Stenotheca wheeleri,* new species.
8. *Platyceras romingeri* Walcott
9. *Platyceras bellianus,* new species.
10. *Acrotreta depressa* (Walcott)
11. *Micromitra* (*Iphidella*) *pannula* (White)

12. *Obolus mcconnelli* (Walcott)
13. *Nisusia alberta* Walcott
14. *Philhedra columbiana* (Walcott)
15. *Scenella varians* Walcott
16. *Anomolocaris canadensis* Whiteaves
17. *Anomolocaris whiteavesi,* new species.
18. *Anomolocaris (?) acutangulus,* new species.
19. *Agnostus montis* Matthew
20. *Dorypyge (Kootenia) dawsoni* (Walcott).
21. *Bathyuriscus rotundatus* (Rominger)
22. *Bathyuriscus pupa* Matthew. Probably 23.
    Conocephalites cf. *perseus* Matthew—30.
    Corynexochus romingeri Matthew—25.
23. *Bathyuriscus occidentalis* (Matthew)
24. *Bathyuriscus ornatus* Walcott
25. *Karlia stephenensis* Walcott
    Neolenus granulata Matthew—26.
26. *Neolenus serratus* (Rominger)
27. *Ogygopsis klotzi* (Rominger)
28. *Oryctocephalus reynoldsi* Reed
29. *Burlingia hectori* Walcott
30. *Ptychoparia cordillerae* (Rominger)
31. *Ptychoparia palliseri,* new species.
32. *Zacanthoides spinosus* (Walcott)

DESCRIPTION OF PLATE I.

MICROMITRA (IPHIDELLA) PANNULA (White)

Figs. 1, 1a, 1b. Top, side and back views of a ventral valve.

Fig 1c. Surface greatly enlarged.

OBOLUS MCCONNELLI (Walcott)

Fig. 2. An imperfect ventral valve, enlarged.

Fig. 2a. A dorsal valve, enlarged.

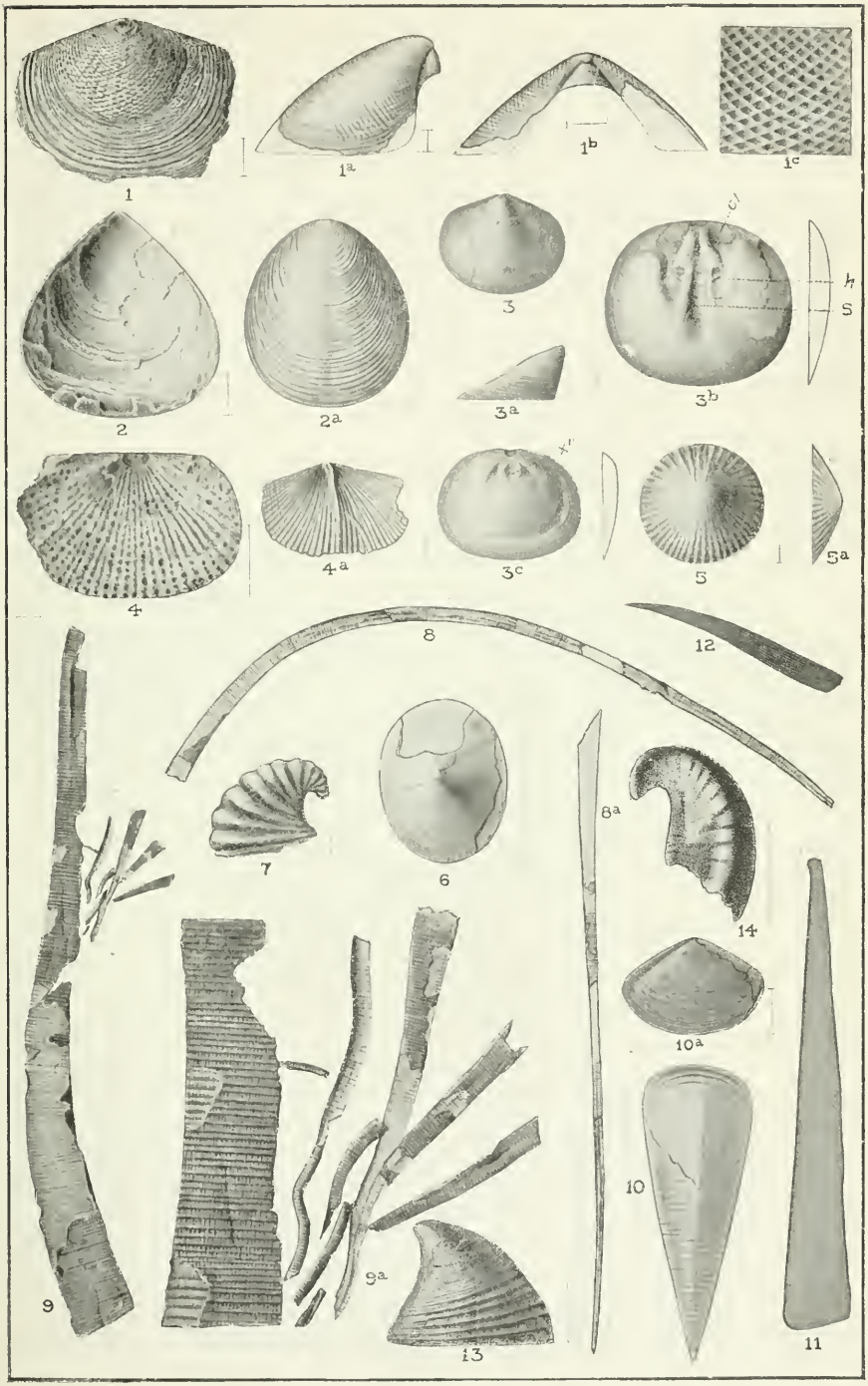


PLATE I.—MT. STEPHEN FOSSILS

ACROTRETA DEPRESSA (Walcott)

Figs. 3 and 3a. Top and side views of an elevated ventral valve.

Fig. 3b. Cast of the interior of a dorsal valve.

Fig. 3c. Cast of the interior of a ventral valve.

NISUSIA ALBERTA (Walcott)

Fig. 4. A cast of the exterior surface showing bases of surface spines.

Fig. 4a. A compressed valve.

PHILHEDRA COLUMBIANA (Walcott)

Figs. 5 and 5a. Top and side views, greatly enlarged. (Very rare).

SCENELLA VARIANS Walcott

Fig. 6. Top view of a specimen with the apex nearer the center than usual.

STENOTHECA WHEELERI, new species.

Fig. 7. Side view of the type specimen. (Comparatively rare).

HYOLITHELLUS FLAGELLUM (Matthew)

Fig. 8. A long curved specimen.

Fig. 8a. A slender nearly straight specimen.

HYOLITHELLUS ANNULATA (Matthew)

Fig. 9. A large specimen with a group of small tubes adjoining it.

Fig. 9a. Enlargement of a portion of the specimen represented by figure 9. The small tubes are much like those of *Hyolithellus flagellum.*

HYOLITHES CARINATUS Matthew

Fig. 10. Shell as it appears flattened in the shale.

Fig. 10a. Operculum that covered the opening of the shell.

ORTHOTHECA MAJOR, new species.

Fig. 11. This is a thin shell compressed in the shale.

ORTHOTHECA CORRUGATA Matthew

Fig. 12. Portion of a flattened tube.

PLATYCERAS (?) BELLIANUS, new species.

Fig. 13. Side view of shell flattened in the shale. (Very rare).

DESCRIPTION OF PLATE II.

OLENELLUS GILBERTI Meek

Fig. 1. Introduced to show the character of the trilobites which occur in fragments at the tunnel near the north base of Mount Stephen.

ANOMOLOCARIS (?) WHITEAVESI, new species.

Figs. 2 and 2a. Broken and compressed specimens of the carapace.

Figs. 6 and 6a. Abdominal segments tentatively referred to this species.

Fig. 4. A caudal segment, probably of this species.

ANOMOLOCARIS CANADENSIS Whiteaves

Fig. 3. Carapace referred to this species. This is the most abundant form of carapace.

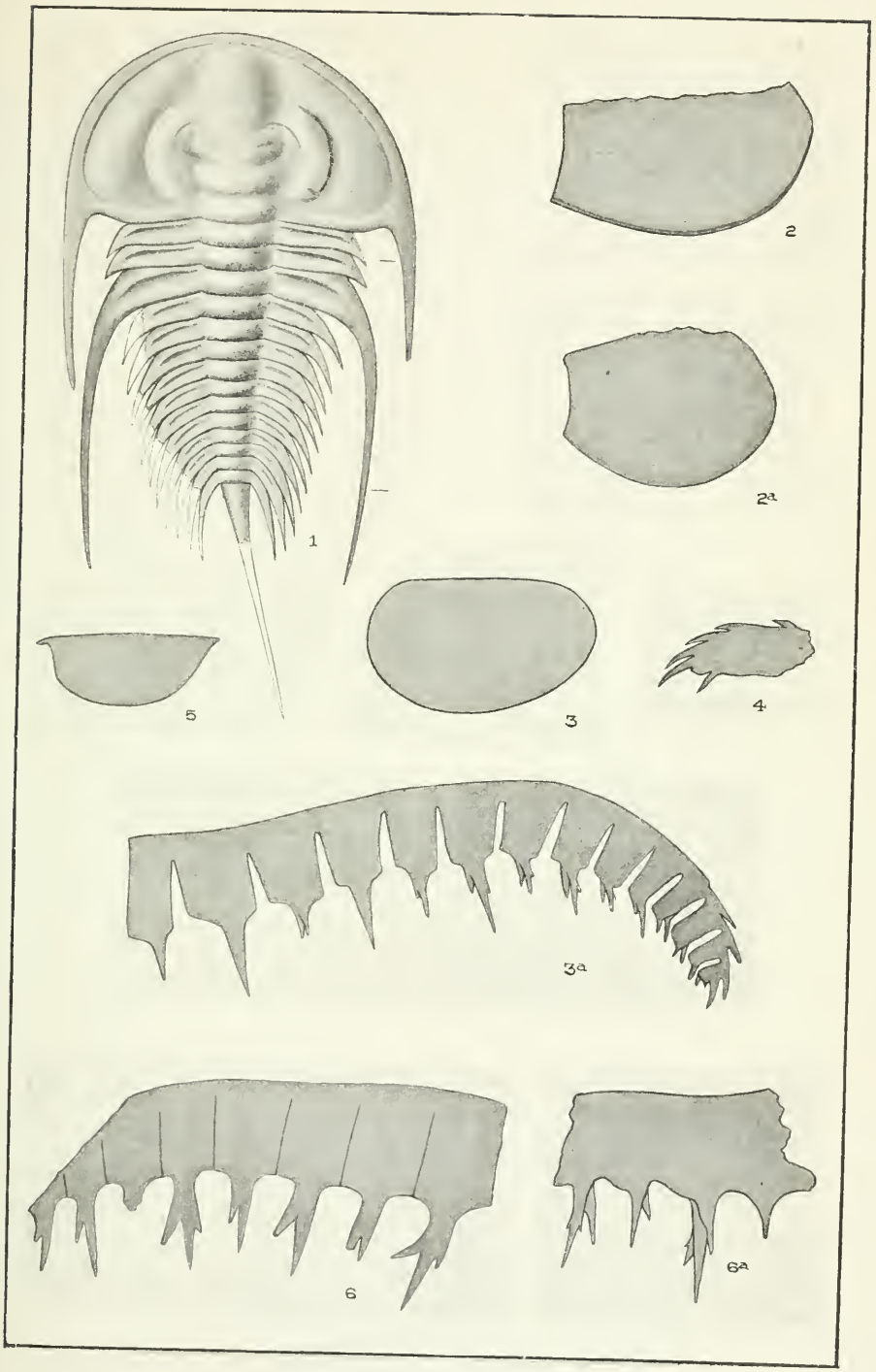


PLATE II —MT. STEPHEN FOSSILS

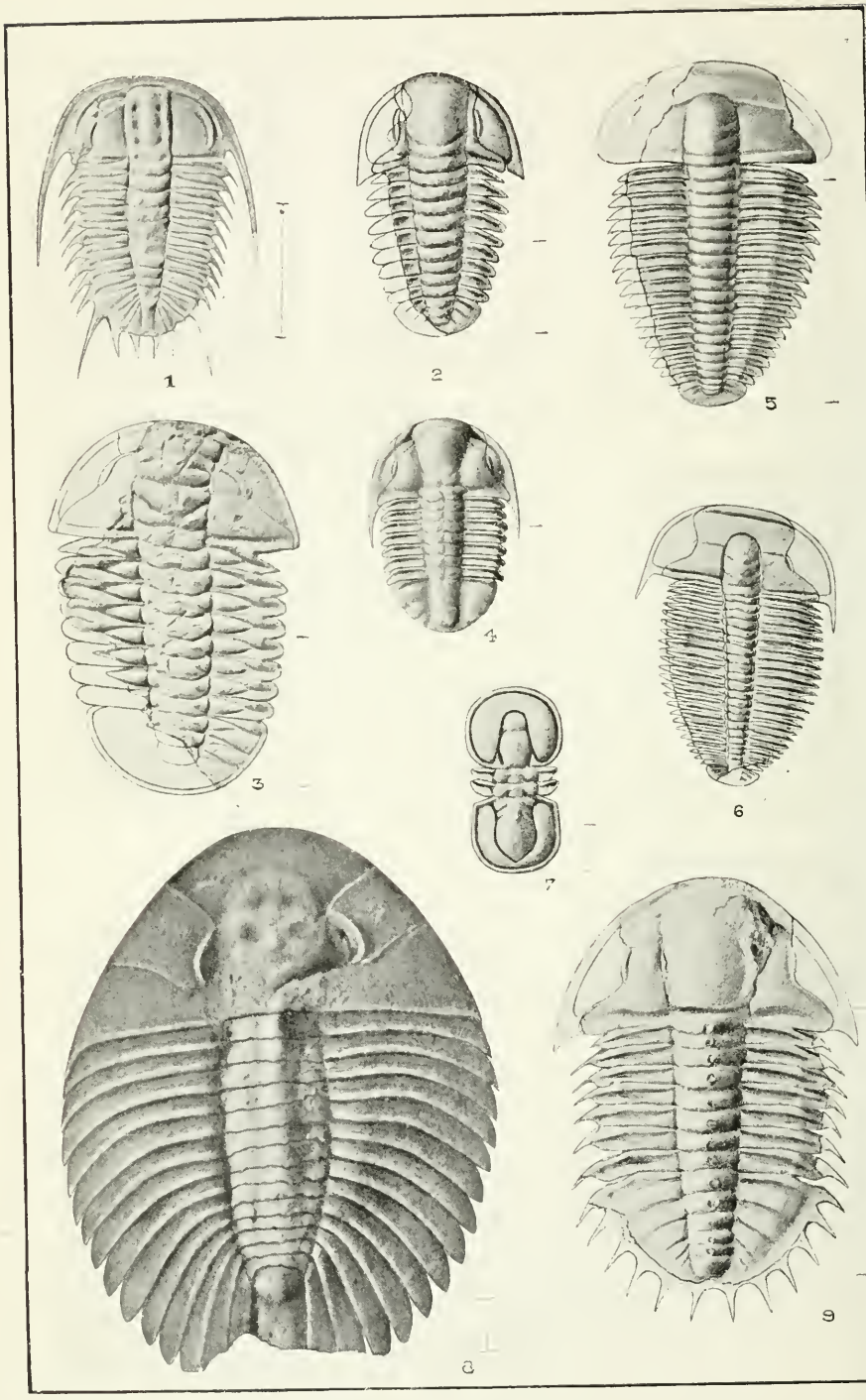


PLATE III.—MT. STEPHEN FOSSILS

Fig. 3a. Thirteen abdominal and one caudal segment.

ANOMOLOCARIS (*?*) *ACUTANGULUS,* new species

Fig. 5. A carapace, very rare.

DESCRIPTION OF PLATE III.

ORYCTOCEPHALUS REYNOLDSI Reed

Fig. 1. A nearly entire specimen twice enlarged. Not rare.

BATHYURISCUS OCCIDENTALIS (Matthew)

Fig. 2. A very rare species.

BATHYURISCUS ORNATUS Walcott

Fig. 3. A comparatively rare species.

KARLIA STEPHENENSIS Walcott

Fig. 4. A small and rather rare species.

PTYCHOPARIA CORDILLERAE (Rominger)

Fig. 5. This is one of the common species. It is usually about one-half the size of this figure.

PTYCHOPARIA PALLISERI, new species.

Fig. 6. A large rare species.

AGNOSTUS MONTIS Matthew

Fig. 7. The fragments of this species are very abundant in some layers.

BURLINGIA HECTORI Walcott

Fig. 8. Greatly enlarged. This is a small, very rare species.

DORYPGE (KOOTENIA) DAWSONI Walcott

Fig. 9. A large specimen. Not very abundant, but often mistaken for *Neolenus serratus.*

DESCRIPTION OF PLATE IV.

ZACANTHOIDES SPINOSUS (Walcott)

Fig. 1. A large specimen partially crushed in the shale. A common species.

BATHYURISCUS ROTUNDATUS (Rominger)

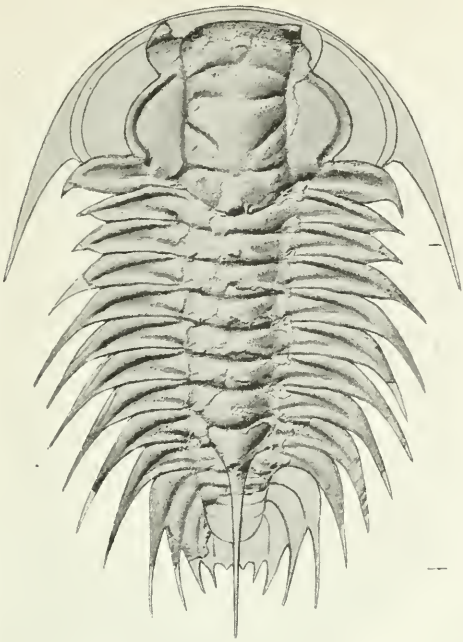
Fig. 2. The average size of this species is about one-half that of this figure. It is quite abundant.

NEOLENUS SERRATUS (Rominger)

Fig. 3. A common species.

OGYGOPSIS KLOTZI (Rominger)

Fig. 4. This is the largest and most abundant trilobite in the fossil bed.



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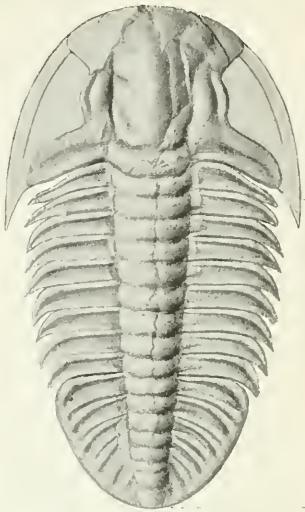

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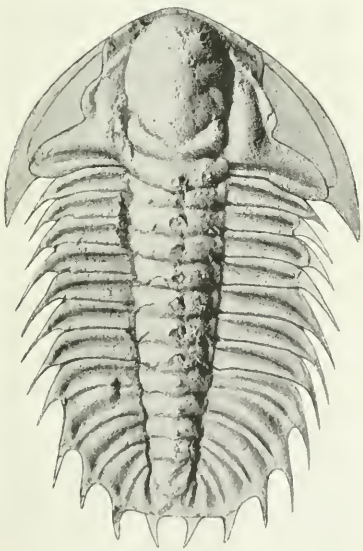

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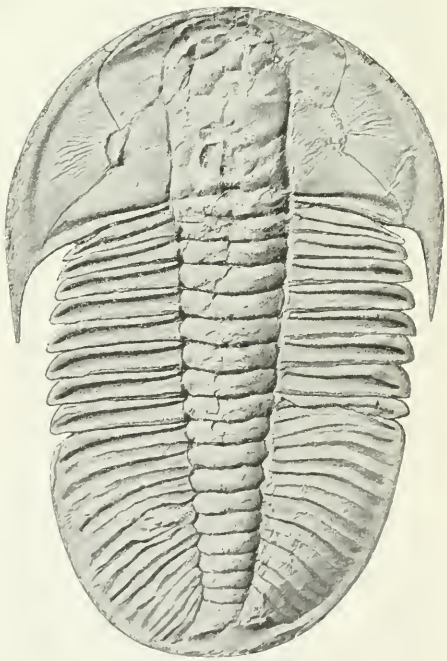

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PLATE IV. — MT. STEPHEN FOSSILS

THE NATURE AND ACTIVITY OF CANADIAN GLACIERS.

By William Hittell Sherzer.

None the less attractive the glacial student than to the mountain climber is that grand array of peaks and snow-fields which stretches poleward through the western part of the Dominion of Canada. Here upon a magnificent scale and in endless variety and profusion one may recognize the various types of glaciers, detect in them every feature known to science and about them every form of geological activity ascribed to these great engines of rock destruction and transportation. About the peaks and ridges and in the higher valleys there accumulates season after season layer upon layer of snow, which, by its own pressure, surface melting and occasional rain or cloud mist is gradually compacted into ice. Indefinite accumulation of this congealed moisture is prevented by one of those beneficent provisions of Nature by which, under the influence of its own weight, this ice in frozen streams, or shorter tongues, moves slowly to lower levels where complete melting may occur and this moisture again be put into general circulation. Were it not for this the Canadian Rockies and Selkirks would be encased in a great ice ridge, extending as high into the atmosphere as it is possible for moisture to be lifted, from the sides of which tremendous avalanches would hurl themselves to the adjacent plains, deeply covering regions now free from snow during a portion of the year.

Although the mechanics of glacial motion are not yet fully understood, these ice-streams appear to move much as would a similar mass of asphaltum, with which

they have often been compared. They conform more or less perfectly to the shape of the valley and irregularities of the bed, move more rapidly towards the centre and upper surface than toward the sides and bottom, flow more rapidly down steep slopes than gentle ones, and are more active during the day than at night and in summer than in winter. Where compelled to change their course too suddenly, or when subjected to a certain degree of tensional stress, great cracks are slowly opened at right angles to the direction of such stress. When one portion of the mass begins to lag it may be thrust forward bodily by great pressure from behind, compelled to mount reverse slopes, to scour the bed, detach rock fragments and transport whatever material finds lodgment within or upon the mass.

1.—*Conditions Requisite for Glacial Formation.*

In order that a certain region may support glaciers four conditions must be fulfilled, no two or three of which alone will suffice. (*a*) There must first be a degree of cold that will cause some of the precipitation to fall as snow or hail without which a glacier would be impossible. (*b*) The amount of such precipitation must be sufficiently great so that, in spite of the seasonal melting and evaporation, there will be a remnant to add to the accumulation of previous years. The entire snowfall of any year, or any short series of years, may be destroyed by melting, but, upon the whole, there must be more or less steady increase in the amount of congealed moisture. (*c*) There must be a collecting area, which from its shape or slope is capable of retaining the requisite amount of snow and ice. If the slope is too steep the snow will be avalanched from the area before the glacier has time to come into existence. (*d*) Finally, the local conditions must be of such a nature as to permit of the inauguration of a movement in which

MT. MACOUN MT. DAWSON

A. O. Wheeler, Photo

EASTERN MARGIN OF THE ILLECILLEWAET LOCAL ICE-CAP, SELKIRKS, B.C.

Note the relatively even character of the surface of the cap and its freedom from crevasses and rock débris.

there is more or less of a horizontal component. The chief factors concerned are the configuration of the collecting area and the weight of the accumulated snow. If movement is not permitted the entire mass remains a snow bank, or heap of stagnant ice which does not possess the essential characteristics of a glacier.

Space does not permit the discussion here of the distribution of modern and ancient glaciers over the face of the earth by which the application of the above conditions might be more readily comprehended by the reader. In general it may be said that when a glacier exists today these four conditions have been satisfactorily met in the past, although one or more of them may be now lacking. If a given area does not support a glacier, one or more of these conditions has been wanting, just which ones being readily determined by an inspection of the region. In the Canadian Rockies and Selkirks we find ideal conditions for glacier formation: broad valleys, basins and gentle slopes; high altitude and latidude; moisture-laden winds from the Pacific, causing heavy snowfall upon the western slopes and about the crests of these great systems.

When exposed to the warm rays of the sun the snowflakes melt into small globules which are subsequently frozen into pellets resembling granular tapioca. The snow in this condition is flnown as *firn* or *névé,* and from its consolidation the glaciers take their origin. In some way not yet fully understood the granules of the névé gradually diminish in number and increase in size until they attain the size of hazel-nuts or walnuts, or even the size of the fist in large glaciers like the Yoho and Illecillewaet. So long as the temperature of the ice is well beneath the freezing point these granules are not in evidence, the ice appearing compact and homogeneous. When, however, it begins to feel the effect of a higher temperature, there appears a delicate system of capillary tubes, outlining the granules and extending some dis-

tance into the ice mass. As melting proceeds these capillaries develop into narrow fissures separating the granules, and in the final stage a sharp blow will cause the ice to crumble into these component granules. It is in this granular structure that glacial ice is distinguished from that which results from the direct freezing of water, as in lakes, ponds and the pools and crevasses of the glaciers themselves. Such ice, commonly spoken of as "water-ice," consists of approximately parallel prisms, arranged with their axes perpendicular to the freezing surface. This structure is often strikingly shown in the case of lake and river ice when in the spring it is undergoing disintegration.

2.—Principal Types of Glaciers.

Without attempting to draw any sharp lines of distinction between them there may be recognized four types of glaciers, all but one of which have numerous representatives in the Canadian Rockies and Selkirks. This one, not now represented, occupied the region during the previous geological epoch and its work is much in evidence in and about the mountains. These types may best be described in the order of their simplicity, frequency and development.

(*a*) *Alpine Glaciers.* In its simplest from this type originates from the snow which accumulates about a mountain pass, or within an amphitheatre, combined with that precipitated directly into the valley, or avalanched from the adjacent slopes. Having much the appearance of a great frozen river, it slowly winds its way down the valley to a level determined by a number of factors; chief of which are the latitude, thickness of the ice, exposure to the sun, amount and distribution of rocky débris and the amount of snow and ice urging the glacier forward. Canadian examples are the Victoria, Yoho and the easternmost stream of the Asulkan

THE ASULKAN GLACIER FROM MT. AVALANCHE

The entire series represents a hanging Piedmont glacier in a state of decadence, the four right-hand components having separated into small Alpine glaciers. The three left-hand components are still united, forming the Asulkan Glacier, but have started to separate.

GENERAL VIEW OF VICTORIA GLACIER AND ITS TRIBUTARIES

Copyright, 1902, by Detroit Photographic Co

glaciers. The snow line crossing the glacier divides the upper surface into two regions which are designated as the *névé*, or region of perennial snow, and the *dissipator*, or that portion ordinarily free from snow during late summer and early autumn. Glaciers of the alpine type may receive tributaries from confluent valleys and these in turn receive tributary ice-streams. If we consider that the Mitre Glacier originates about the Mitre Pass, it receives a short, broad tributary from between Mitre Mountain and Mount Lefroy and together they join the Victoria, being compressed to about one-fifth of their breadth. Not infrequently it happens that the main glacial stream does not fill the valley and it is separated from its tributary streams by a precipice, or very steep slope over which the ice and snow are avalanched. The higher glacier is termed a *hanging* or *cliff* glacier, as seen upon the eastern shoulders of Mts. Victoria and Lefroy, and the glacier formed by the recementing of the ice fragments is spoken of as a *reconstructed* or *regenerated*. A very interesting example of such a regenerated glacier is formed from the hanging Lefroy, the fragments of which accumulate at the foot of the eastern wall of Mt. Lefroy, upon the upper western margin of the Mitre Glacier. There is piled up there, mainly in the summer, a mass of ice fragments, along with the ground-morainic material manufactured beneath the hanging glacier, which gives rise to a regenerated glacier resting upon the Mitre and which is more or less independent of it. The course of the regenerated Lefroy is across the Mitre, where it dumps upon the opposite side a great heap of ground moraine, while it is at the same time carried bodily toward the Victoria. Such a glacier, of which this is the best example known, has been more or less appropriately called *parasitic*.

(*b*) *Piedmont Glaciers.* When a well-nourished glacier of the alpine type flows from a valley out upon the adjacent plain it has a tendency to spread laterally

as soon as the restraint of the rocky walls is removed. In the case of such glaciers derived from a series of neighboring valleys their expanded extremities may coalesce laterally and form a glacier of the *piedmont* type. The separate alpine glaciers retain their independence so far as nourishment, structure, rate of movement and geological work are concerned and may better be termed *commensal* streams than tributaries. In their form, size and direction of movement they are more or less affected by their neighbors, gaining in protection and power by the union, so that a piedmont glacier is able to maintain itself at a lower level than could its separate commensals. Such glaciers are peculiarly broad and short and present a relatively great amount of frontage, which is more or less irregular or lobed by the noses of the component streams, some of which may be advancing while others are stationary or in retreat. The Wenkchemna Glacier is an interesting example of this type, having a length of one-half to one mile, a breadth of about three miles and a frontage of over three miles. About a dozen commensal streams may be recognized which originate in the minor depressions upon the protected northern slopes of the Ten Peaks. The Horseshoe Glacier at the head of the neighboring Paradise Valley is of this same type, containing some sixteen alpine, component streams.

A similar although less characteristic type of piedmont glacier may originate upon an elevated mountain slope, which is crossed by a series of sub-parallel depressions, separated by rather low divides. Each depression may at first support a small alpine glacier, which, under favorable conditions for growth, may increase in thickness until it more than fills its bed and unites laterally with its neighbors. If the supply of snow is sufficiently reduced, the loss by wind action, melting and evaporation may uncover again the divides and the piedmont glacier shrinks into its original alpine compon-

A. O. Wheeler, Photo

GENERAL VIEW OF THE WENKCHEMNA GLACIER

A PIEDMONT TYPE

Note the peculiar form of the glacier, the very general débris covering and the scanty snow supply of the component streams.

ents; thus attaining its second childhood. Such a glacier would have the position of a hanging or cliff glacier and might nourish another of the alpine type or give rise to a regenerated glacier. Upon the high western slope of the Asulkan Valley there existed such a glacier in recent geological time, which avalanched its ice to the alpine glacier which occupied the valley itself. The Asulkan Glacier, with its three commensal streams, is all that is left to show the piedmont character of the original, the remainder of the glacier having been resolved into its alpine components, lying between the Dome and Mt. Abbott.

(*c*) *Local Ice-Caps.* These are extensive fields of stratified ice and snow which are represented in the Rockies by the Waputik and Columbia Ice-fields and in the Selkirks by the smaller Illecillewaet field. They must originate in a system of alpine and piedmont glaciers which have been unable to drain away the ice as fast as it was supplied, and, if the expression may be permitted, the entire region is flooded with snow and ice. Accumulation continues until the lobes of ice which come into existence about the margin of the cap are able to drain away the excess, when an approximate condition of equilibrium is established. These marginal lobes may reach neighboring valleys, or the adjacent plains, and give rise to alpine and piedmont glaciers. The surface of such ice-caps is generally sloping or undulating, strongly ripple-marked by wind action and free from rock débris. Owing to the thickness of the ice and its sluggish conditions, crevasses are not common. Occasionally rocky islands protrude through the frozen sea and are known as *nunataks*. If the supply of snow is sufficiently reduced the surface of the cap is slowly lowered, the marginal lobes are withdrawn and there may remain only the original piedmont and alpine glaciers from which the cap was developed. The field evidence is that all the existing group of

glaciers in the Rockies and Selkirks were, in recent geological time, encased in such deposits of ice and snow, with only the higher peaks and ridges protruding.

(*d*) *Continental Ice-sheets.* During the so-called Pleistocene stage of the earth's history conditions were favorable for the formation of glaciers over the entire region between the Rockies and the Pacific and from the International Boundary to Alaska. These conditions resulted from an increased precipitation over the region and a reduction in the mean annual temperature. In the way above noted local ice-caps developed wherever favorable conditions existed and later were completely buried in snow and their outlines obliterated. With the submergence of the higher ridges the filling of the intervening valleys would go on slowly and at one stage the entire western portion of the Dominion was heavily encased in ice. The movement was mainly to the north, west and south, but piedmont glaciers of great magnitude developed along the eastern margin of the Rockies and reached out for many miles over the plains. In our imagination we may apply the same characteristics to this great ice-sheet, with its complex of submerged glaciers, that were noted for the local ice-cap. Climatic conditions finally changed and this continental type of glacier was slowly resolved into its components, only relatively few of which still remain to grace the landscape. Two similar ice-sheets developed further eastward, either simultaneously or subsequently, one centering to the west of Hudson's Bay and the other in Labrador. Existing glaciers of this type are found in Greenland and the Antarctic region.

3.—*Geological Work of Glaciers.*

Within the sphere of their activity glaciers may become powerful geological agents, destroying or modify-

A. O. Wheeler, Photo

MT. BALFOUR AND BALFOUR GLACIER FROM BOW PEAK

The view is of unusual geological interest, showing the relation of the névé-field to the short, Alpine glacier, the work of the drainage stream in covering the valley floor with gravel, and the formation of an extensive delta at the head of the lake. The left lateral and two medial moraines are well shown, as well as the transverse and marginal crevasses.

I. Sherzer, Photo, 1905

EROSIVE ACTION OF GLACIERS SHOWN UPON QUARTZITE
NEAR HEAD OF PARADISE VALLEY

Notice the planing and striating of the upper surface, and the disrupting "plucking" of the massive blocks

A. O. Wheeler, Photo, 1902

ing former physiographic features and producing others anew. This phase of glacial study may be best presented under three headings.

(*a*) *Glacial Erosion.* The eroding action of pure ice upon firm rock, varying in hardness from that of limestone to quartzite, is apparently slight and limited to a smoothing and polishing effect. When the glacier is shod with rock fragments, as is frequently the case, and has considerable thickness, the erosive effect may be great if the action is prolonged. Hard rocks are gouged, scratched and planed and the fragments reduced to pebbles, sand and clay. The glacier's rock tools by which this action is accomplished are bruised, battered, planed and scratched and the edges and corners are more or less rounded in a manner entirely characteristic of glaciers. When a glacier of considerable thickness moves over a jointed, stratified rock, especially if the dip of the strata is in the direction of the movement, masses of rock may be detached bodily, giving rise to what is termed *plucking.* By this action a glacier may leave its bed rougher than it found it, and furnish the sites for lakelets, such as the exquisite lakes Agnes and Louise. An unusually fine example of this type of glacial erosion may be seen near the head of Paradise Valley, where blocks of quartzite as large as small houses have been disrupted from the parent bed and shifted but a short distance. Standing upon the undisturbed portion of the beautifully glaciated bed and looking down the valley it is difficult to escape the conviction that many feet of strata have been similarly removed. Many valleys in the Rockies and Selkirks appear to have been deepened and given their characteristic U-shape by alpine streams during the maximum period of glaciation. Their side walls, up to a certain height, have been smoothed and mountain spurs uniformly truncated, as well shown upon the Lake Louise side of Mt. Fairview. Glaciers exert this erosive power to their

very heads and excavate often a semi-circular amphitheatre, or *cirque,* which may eat its way into the heart of a mountain and assist the atmospheric agencies in its destruction. A good example of such work is seen in the elevated Lake Agnes Valley, the glacier having nearly or quite disappeared from the region.

(*b*) *Transportation.* The loose material which a glacier finds in its path, along with that which it is able to pluck from its bed, is urged forward by sliding and rolling, or it may be incorporated into the base of the ice and transported bodily. Aside from the wind-blown dust which may be more or less evenly distributed throughout the body of the ice, the bulk of the material transported by the local ice-caps and continental ice-sheets lies in the basal layers. In the case of alpine and piedmont glaciers, however, from overtowering cliffs the active atmospheric agents may detach rock fragments which find their way to the surface of the glacier. If they reach the névé they may be incorporated into the body of the glacier, to appear later either at the surface of the dissipator or its extremity. Material carried thus either upon or within the ice suffers little abrasion compared with that at the base, but by means of crevasses and moulins it may work its way down to the lower zone. The transporting power of a glacier differs very markedly from that of a river since it is in no wise dependant upon its velocity. Rocks as large as a city block may be handled quite as easily as a grain of sand.

Owing to its relation to the steep cliffs of the Ten Peaks the Wenkchemna receives rock fragments along its entire breadth. In the case of the Victoria the upper valley is sufficiently narrow so that avalanches from Lefroy and Victoria may reach entirely across the névé, thus distributing rocky debris throughout the glacier there in process of formation. When brought below the snow-line by the forward movement there is a concen-

tration of this material over the entire surface of these two glaciers, forming a thin veneering by which further melting is much retarded. Ordinarily the rock fragments accumulate in a relatively narrow zone along the margin of the glacier where they are moved very slowly forward, protecting from melting the ice upon which they rest until there is produced a sharp-crested ridge upon either side of the glacier—the *lateral moraines*. When such a moraine towers above the nose of the glacier more than a hundred feet, as is the case with the Illecillewaet, it is difficult for the ordinary observer to believe that it is essentially an ice-ridge with scarcely a foot of rock veneering. For the last few years the left lateral of the Asulkan has been shedding its cover near the lower end and this ice-core is well exposed and is being slowly destroyed.

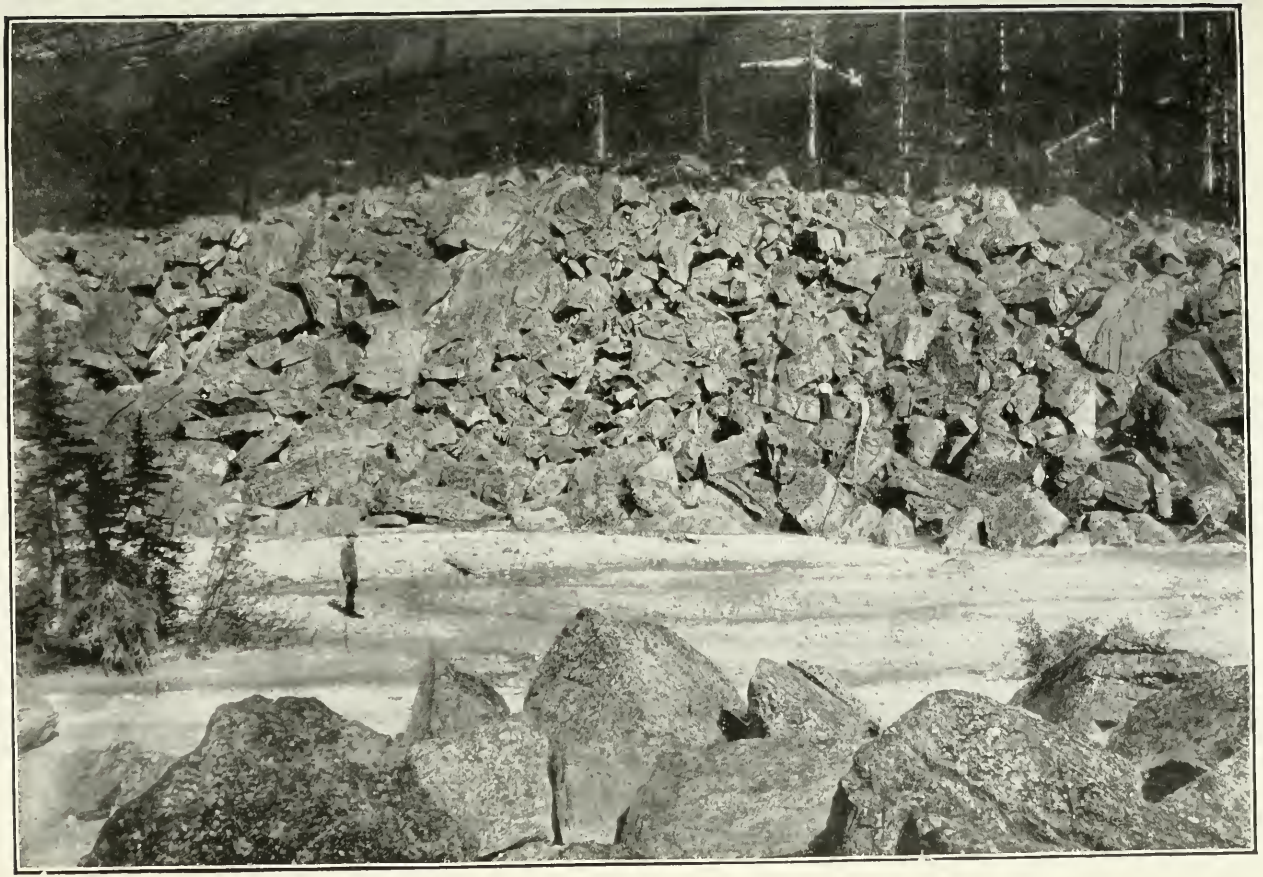
When a glacier has a tributary, as in the case of the Victoria, the adjacent lateral moraines of the trunk and tributary streams unite and form a *medial moraine*, which has much the same appearance as the laterals. Under ideal conditions there will be one such medial for each tributary stream. Owing to the more rapid movement of the ice upon which they rest there is not the opportunity for the development found in the laterals. The material which rests upon the surface of the glacier has suffered but little abrasion and is thus readily distinguished from that which has occupied a basal position. Whenever a glacier is nourished, however, by a hanging glacier, as is the Lefroy, Victoria and Yoho, there occurs a mixture of the two types of material in the lateral moraine.

(*c*) *Deposition.* While the glacier is still in possession of a region there is being deposited in certain protected places beneath the ice the clay, sand and glaciated boulders, firmly pressed together and typically unassorted. Bluish-gray in color, until it is oxidized, this constitutes the *ground-moraine*. Owing to the action

of sub-glacial streams patches of stratified sand and gravel may occur locally, the clay being carried away by the drainage. On account of the relatively slight grinding action of the present Canadian glaciers and lack of opportunity for lodgment, no extensive deposits of this ground-moraine or *till* are now forming. In connection with the great continental ice-sheets, however, deposits were formed several hundreds of feet in thickness.

During the process of retreat all the material carried in or upon the ice must be deposited as fast as complete melting proceeds. The rock débris of the lateral and medial moraines will be set down in corresponding lines or ridges, but of surprisingly insignificant proportions when contrasted with the original moraines. Rock fragments distributed over the general surface of the glacier will be somewhat evenly distributed over the bed as it is uncovered, so long as the retreat is fairly uniform. In case the melting at the lower extremity, however, just equals the forward movement, the end of the glacier comes to a halt and its load is dumped in a ridge, forming a *terminal moraine*, providing we have a glacier of the alpine type, which alone can be considered to have an *end*. In the case of the three other types of glaciers such moraines, testifying to the stages of halt of the front, but not of the ice itself, are known as *frontal moraines*. A good example is seen in connection with the Wenkchemna, previously referred to.

A noteworthy type of ancient moraine is found in connection with the five most accessible glaciers along the Canadian Pacific Railway, viz., the Victoria, Horseshoe, Wenkchemna, Illecillewaet and Asulkan Glaciers. In each case its double character can be made out, either through its disposition in separate ridges, or differences in age where heaped together. The moraines consist of massive blocks of quartzite and sandstone heaped tumultuously together without the usual filling



W. H. Sherzer, Photo, 1904

OLDER OF THE TWO "BEAR-DEN" MORAINES, VICTORIA GLACIER, CANADIAN ROCKIES

The coarse character of the blocks and the lack of filling material are believed to have resulted from the loading of the ancient glacier by means of an earthquake shock.

of gravel, sand and clay, differing strikingly from the moraines formed previously and subsequently. Between the great blocks, many of enormous size, spaces permit the entrance of man and other animals, so that Professor Tarr's name of *"bear-den moraine"* seems appropriate. Space will not permit a detailed discription here of these moraines, nor a full discussion of their probable origin. There is no reason for thinking that the ordinary filling material was originally present and removed by running water, or other agency. The blocks were not pushed along ahead of the ice, nor carried subglacially, but were carried either upon or within the ice. The ordinary proces of weathering would produce as much fine as coarse material and give rise to a terminal moraine of the ordinary type. An inspection of the cliffs from which the blocks were apparently derived shows that in all the five cases the general trend is northwest to southeast and that the bulk of the material was dropped to the eastward. The only plausible explanation which the writer has been able to frame is that these glaciers became loaded with these coarse blocks as the result of a double earthquake disturbance, which probably crossed the Rockies and Selkirks in a northeast-southwest direction. The two shocks were separated by two or three centuries and the first was either the most severe, or else it found more loose material awaiting its arrival. The mountains of the region appear to have served as a gigantic seismograph to record the time, number, relative intensity and direction of the shocks. A very rough estimate based upon the rings of growth of trees, indicates that these disturbances happened from 700 to 1000 years ago, or from the 10th to the 13th centuries. Glaciers like the Geikie, whose bounding cliffs extend in a northeast-southwest direction, *i.e.*, in the direction of wave transmission, would be able to secure but a slight load and might reasonably be expected to show no such

moraines. Similarly the Yoho glacier, which is not bounded by steep cliffs capable of supplying such blocks no matter how severe the disturbance. Upon the eastern shoulder of Mt. Burgess there lies a mass of coarse blocks, very suggestive of these moraine blocks, which may have been shaken loose at the same time. The members of the Canadian Alpine Club can be of service in extending these observations to the north and south of the railway and in the collection of evidence which might verify or disprove the above hypothesis.

In describing their observations in the Sun Wapta Valley, Stutfield and Collie (Climbs and Exploration in the Canadian Rockies, 1903, page 126) note the occurrence of a similar type of moraine which may date back to the time of those above noted, or may have been due to a purely local rock-slide. In referring to the peaks Woolley and Stutfield, they say: "These two last mountains appeared to have been conducting themselves in a most erratic manner in bygone ages. A tremendous rock-fall had evidently taken place from their ugly, bare, limestone cliffs and the whole valley, nearly half a mile wide, was covered to a depth of some hundreds of feet with boulders and débris. What had happened, apparently, was this. The immense amount of rock that had fallen on the glacier below Peak Stutfield had prevented the ice from melting. Consequently the glacier, filling up the valley to a depth of at least two hundred feet, had moved bodily down; and its snout, a couple of hundred feet high, covered with blocks of stone the size of small houses, was playing havoc with the pine woods before it on either side. In our united experiences, extending over the Alps, the Caucasus, the Himalayas, and other mountain ranges, we had never seen indications of a landslide on so colossal a scale."

It is interesting to note that the Woolley-Stutfield range of cliffs has a northwest-southeast trend and that this rock débris was thrown to the *eastward*. It will be

of much interest to ascertain whether other glaciers, lying between the headwaters of the Athabasca and the railway, which are favorably situated with reference to their cliffs, show such moraines.

BOTANICAL NOTES.

THE ORCHIDACEAE OF THE ROCKY AND SELKIRK MOUNTAINS.

By Julia W. Henshaw.

Orchid-hunting has an irresistible attraction for every lover of Nature. Whether the secret of this fascination lies in the difficulties which beset the search for the rarer species, or whether it is the strange forms, sweet perfumes and tropical appearances of many of the flowers belonging to this eccentric family that inspire so vivid a delight in the breast of man it is hard to determine, but assuredly the traveller does experience a keen thrill of ecstacy on finding one of these uncanny plants closely hidden in some shady swamp, or deep-set amid the tall rank herbage of the hills.

So far I have found twenty-three different species of orchidaceæ in the Rocky and Selkirk Mountains. They are as follows:

Calypso borealis.....Calypso.
Corallorhiza innata.....Early Coral-root.
Corallorhiza multiflora ..Large Coral-root.
Corallorhiza striata..... Alpine Coral-root.
Listera cordata.....Heart-leaved Tway Blade.
Listera convallarioides...Broad-lipped Tway Blade.
Listera borealis.....Northern Tway Blade.
*Spiranthes Romanzoffiana*Ladies' Tresses.
Goodyera Menziesii .....Rattlesnake Plantain.
Goodyera repens.....Small Rattlesnake Plantain.
Habenaria bracteata.....Long-bracted Orchis.

J. W. Henshaw, Photo

CALYPSO
(CALYPSO BOREALIS)

Habenaria obtusata . . . . . Small Orchis.
Habenaria hyperborea . . . Leafy Orchis.
Habenaria orbiculata . . . . Round-leaved Orchis.
Habenaria stricta . . . . . Green Orchis.
Habenaria dilatata . . . . . White Bog Orchis.
Habenaria leucostachys . . Giant Orchis.
Orchis rotundifolia . . . . . Fly-spotted Orchis.
Cypripedium passerinum . White Lady's Slipper.
Cypripedium montanum . Mountain Lady's Slipper.
Cypripedium acaule . . . . . Pink Lady's Slipper.
Cypripedium pubescens . . Large Yellow Lady's Slipper
Cypripedium parviflorum Small Yellow Lady's Slipper

Some of the orchids are quite common in the Rocky Mountains, such, for instance, as the lovely Calypso (*Calypso borealis*) whose large rose-pink sacs, striped with a deeper hue and variegated by yellow spots, form clumps of exquisite color in the deep green forests.

A very interesting and leafless plant is the Early Coral-root (*Corallorhiza innata*) found in quantities in the vicinity of Banff, where numbers of its queer, purplish-green flowers spring on succulent stems from the coralloid roots. Other species found in the Selkirk Mountains are: Large Coral-root (*Corallorhiza multiflora*) and Alpine Coral-root (*Corallorhiza stricta*) the latter being a very rare plant.

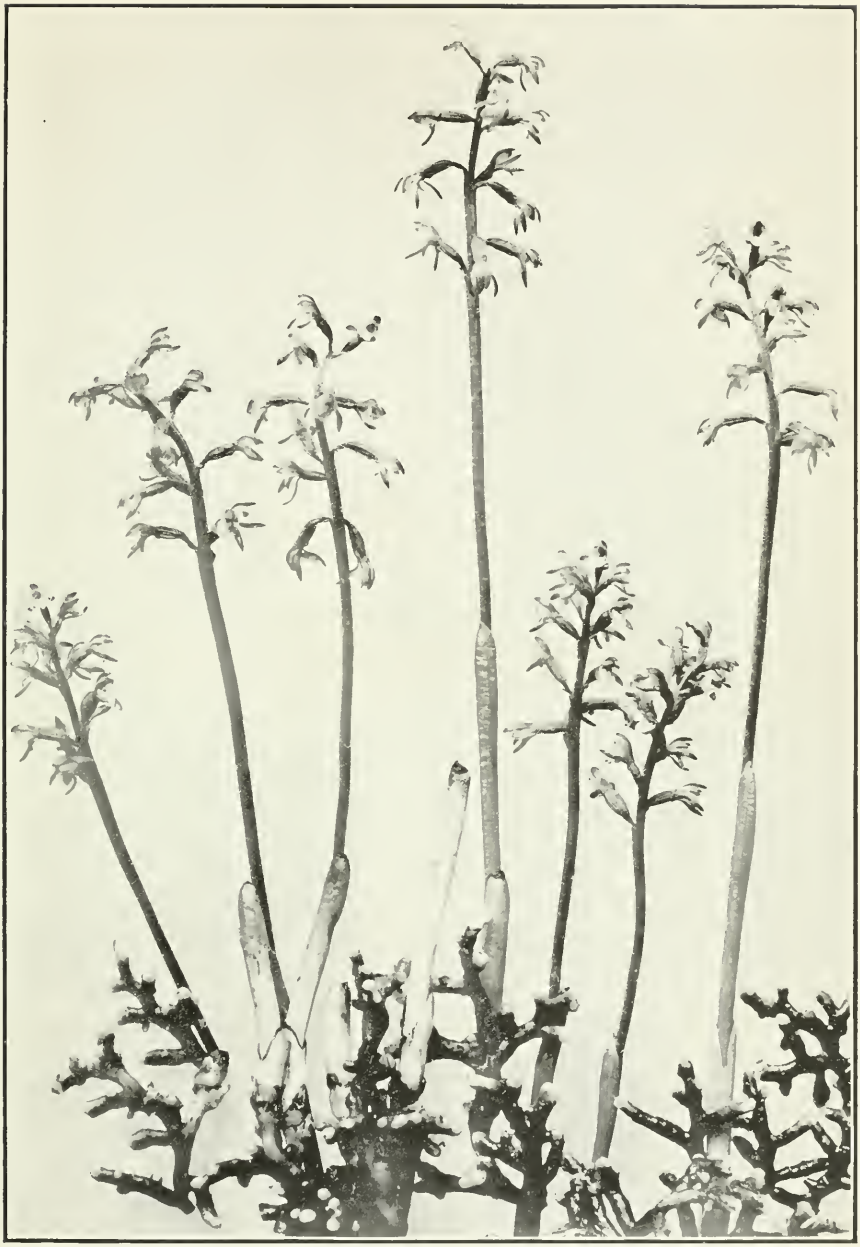
The healthy green Tway Blades (*Listera cordata, Listera convallarioides,* and *Listera borealis*) together with the Rattlesnake Plantains (*Goodyera menziesii* and *Goodyera repens*) the two latter having peculiar white-veined leaves, are all found in the mountain regions, but are comparatively unattractive plants.

Ladies' Tresses (*Spiranthes Romanzofiana*) is a lovely member of the Orchid family found blooming towards the close of the summer in marshy localities, where its dense snowy flower-spikes exhale a fragrant perfume.

The *Habenarias* are very numerous in the mountains. Some of them, such as the White Bog Orchis (*Habenaria dilatata*) and Giant Orchis (*Habenaria leucostachys*) have exquisite large spikes of white sweet-scented flowers and are a perfect prize to the Nature-lover; while others, such as the Long-bracted Orchis (*Habenaria bracteata*), Small Orchis (*Habenaria obtusata*), Leafy Orchis (*Habenaria hyperborea*), Round-leaved Orchis (*Habenaria orbiculata*) and Green Orchis (*Habenaria stricta*) are small plants and have greenish, yellowish or purplish blossoms that are almost scentless. These lesser orchids grow in the woods and beside the trails, and are easily recognized, as each species possesses its own marked individual peculiarities.

On wet, sandy flats and by the margin of the alpine streams grow the pale pink clusters of the Fly-spotted Orchis (*Orchis rotundifolia*), its dainty blossoms splashed with rose color and a single rounded green leaf growing at the base of the plant.

And so we come at last to the most exquisite of all the wild mountain orchids—the Lady's Slipper. To find these wonderful treasures growing in swamp or dell, their curious inflated sacs expanding with tropical luxuriance amid northern alpine surroundings, is a thrilling experience unequalled in the history of flower-hunting; and so completely does the sight of their mysterious beauty enthral the beholder that it is with rapture akin to awe he stoops to gather one of the "Golden slippers meet for fairies' feet" of the Large Yellow Lady's Slipper (*Cypripedium pubescens*) or the Small Yellow Lady's Slipper (*Cypripedium parviflorum*). The great moraine at Emerald Lake, gilt with these conspicuous orchids, is a marvellous sight in July, for, curiously enough, the Large Yellow Lady's Slipper grows both on exposed arid flats and in the deepest seclusion of the woods, while the fragrant Small Lady's Slipper has its haunts close beside the streams.



J. W Henshaw, Photo

EARLY CORAL-ROOT
CORALLORHIZA INNATA)

The two white Lady's Slippers (*Cypripedium passerinum* and *Cypripedium montanum*) are less gorgeous than the yellow species, but are more rare and charmingly dainty in appearance. Their shell-like velvety sacs, spotted inside with carmine, are very lovely.

But the Pink Lady's Slipper (*Cypripedium acaule*), the most rare and the most bewitching of all the orchids —how shall I describe its exotic beauty! A flower carven in coral of rose, it springs like a living flame from the soft green of its setting, exhaling a perfume sweet as the breath of Araby. Lance-shaped purplish sepals spread out on either side to protect the single drooping blossom, and two large leaves spring up from the base to sentinel its majesty, while the great glowing sac is folded together to defy the attacks of depredating bees. The Pink Lady's Slipper is so extremely rare in the Rocky Mountains that I regard my discovery of it in the year 1903 as the crowning triumph of my botanical work in that region.

FLORA OF THE SASKATCHEWAN AND ATHABASCA RIVER TRIBUTARIES.

By Mary T. S. Schaffer.

Another sketch appears in this magazine referring directly to the localities of whose florae I have been asked to write, so there is no need to duplicate a description of the ground covered.

As our stay was to be a long one, it was with dubious feelings that we asked permission to include among the necessities a plant-press and a limited supply of paper. Having collected plants from Banff to Glacier during a number of years, there were days on the earlier part of the journey when we would have been glad to get rid of the cumbersome, troublesome thing, and leave it hanging on some tree till we should return in the fall. But there came a day when a trained botanist went over the result of our perseverence, and we felt repaid for the annoyance and labor involved in gathering the unfamiliar blossoms by the wayside.

Mr. Stewardson Brown, of Philadelphia, has had them all thoroughly studied, and I herewith give a few notes, the result of his work upon them.

As far as the Wilcox Pass we found nothing particularly striking, until reaching a point at about 6000 feet we found the *Pinus flexilus,* its blue-green foliage betraying it quickly among the browner-green of the other trees. The cones, at that time a deep purple, vary from three to five inches in length. From there on we met many strangers (to us) of the plant world. The *Picea Canadensis,* not seen further south, was first noticed on the north shores of the Saskatchewan.

Mary T. S. Schaffer, Photo

PULSATILLA OCCIDENTALIS

Mary T. S. Schaffer, Photo

PINUS FLEXILUS

The *Erigeron acris* we found in August a few hundred feet below the *Pinus flexilus,* and, in the beginning of July, at 8500 feet, the *Ranunculus pygmaeus,* the tiniest butter-cup imaginable, struggling bravely to bloom in the icy winds of Wilcox Pass, and covering the ground like a golden moss wherever the winter snows had receded. Here, also, in full bloom, but or more exposed and barren sections of the pass, was the *Aragallus inflatus.* This was an especially interesting find as I had never seen anything more than the huge, inflated seed-pods before. The flower is a deep sky-blue, and, growing only upon higher elevations, not often seen. We gathered the beautiful crimsoning seed-vessels at the same place, the latter part of August.

From the north fork of the Saskatchewan to the headwaters of the Athabasca the *Primula mistassinica* and the *Primula borealis* grew by the river banks, frequently in beds together; they were as often found apart.

In the Su Wapta flats was growing the *Pilosella Richardsonii,* as also the *Arabis lyrata occidentalis.* The former plant, varying in general characteristics, but withal the same, made our entire journey to Fortress Lake bright, its clusters of white blossoms garnishing the sandy river-bars.

On the Wilcox Pass grew the *Viola cognata,* and in the Fortress Lake region, at about 7000 feet, the *Viola Langsdorfii.* This violet is an especially beautiful, rich, luscious-looking flower, with strong, rank foliage.

Down in the swamps of the Su Wapta we found the *Utricularia vulgaris,* and though known generally throughout Canada, I have never come across it in the mountains further south. At the same time of year, and in the same section, but at 7000 feet, we found the purple-crimson blooms of the *Telesonix heucheriformis.* Wedged deep in the cracks of the rocks, it was impossible to get any of the specimens entire. One and

two hundred feet above this point we found the strawberry (*Fragaris bractcata*) : great luscious berries three-quarters to one inch long. Sweeter than many a cultivated variety, they were welcome company at a height where there was no water.

On September 9th, we climbed a bare, rocky point to look for Brazeau Lake. There was little of the floral life left, though fungi of many varieties were very numerous, even to tree-line, and we were surprised to come across the little *Erigeron lanatus* at 9000 feet. The plant was a new one to me, though Professor Macoun mentions finding it at high points further south. The rays are a deep rose-violet, and the rest of the plant covered with long white hairs. As it lay blooming in the scree close to the summit of the mountain, it had the appearance of a purple flower nestling in a bed of cotton.

By the latter part of August all the river banks were a continuous strawberry bed, a welcome addition to our limited larder, but we never saw a bush of the blueberry (*Vaccinium ovaliform*) which grows so profusely in the Selkirks. Occasionally we came across the *Vaccinium erythrococcum,* whose tiny red berries made very tiresome picking, but were very good and toothsome when once gathered.

We found very many plants familiar to us as growing near the railroad, but with limited space I have only jotted down the strangers. It will be seen by this list that they are largely the plants best known as having their habitation in the more northern mountains of the Pacific slope.

We had stolen a march into the meeting grounds of two distinct floral sections, an interesting ground for a botanist who has time in the future to go so far from the beaten way.

MOTION OF THE YOHO GLACIER.

By A. O. Wheeler.

At the close of the Paradise Valley camp, on July 15th, 1907, the President with two assistants and a packer made a flying trip up the Yoho Valley, *via* Emerald Lake, to visit the Yoho Glacier and inspect the row of metal plates set out the year previous. It was intended to ascertain by trigonometric methods the extent of the movement of the ice-tongue down its bed.

The party camped for the night a short distance south of Lake Duchesney, and, early the next morning, July 16th, pushed on to a camp ground within a mile of the ice-tongue.

The glacier was at once visited, and, cutting steps in the ice forefoot, the party reached the comparatively level portion of the tongue where the plates had been set. The row of metal plates placed across the surface of the ice to mark the movement of the forefoot had been fixed in position on the 15th July, 1906, and their respective positions were now being checked, just one day later than the exact year. The method adopted in placing these plates will be found in the report given on pages 149-158, Vol. I., No. 1, of this Journal.

Of the six plates first set out, all were found, though No. 3 had fallen into a shallow crevasse. It was lifted from this and placed on the surface above at a point 10.5 feet farther to the south. As it is likely it received additional impetus from the fall one way or the other, its movement in relation to the original line of plates cannot be absolutely depended upon.

In 1906, three sets of observations were inaugurated: (1) to obtain rate of surface flow; (2) to ascertain retreat or advance; (3) to observe the annual change in the ice formation at the snout.

To Obtain Rate of Surface Flow.

Both ends of the base established in 1906 were now occupied with the transit, and readings taken upon the plates in the positions in which they had been found. Work was completed at the south end, but, while that at the north was still in progress, rain came on, stopping the work and driving the party back to camp.

Next morning, July 17th, work was resumed and the readings completed at the north end of the base. The plates were then set in line afresh and their positions fixed by angular readings from the south end. On the accompanying map the original line of plates is shown and the points at which they were found twelve months later. The table below shows the respective movements as measured from a plot of the several readings taken at the ends of the base.

Table Showing the Motion of Plates Set on the Yoho Glacier, between 15th July, 1906, and 17th July, 1907.

Plate	No. 1	No. 2	No. 3	No. 4	No. 5	No. 6
Yearly Motion	29 ft.	74 ft.	89 ft.	124 ft.	134 ft.	124 ft.
Daily Motion	0.95 in.	2.43 in.	2.93 in.	4.08 in.	4.41 in.	4.08 in.

A glance at the map shows that the greatest movement has taken place in the locality of Plates IV., V. and VI. The reason is that the main body of ice is swung to the right against the cliffs seen in illustration No. 1.

This panorama shows the striation of these cliffs by the ice in past years, when the glacier filled up the trough as high as the upper line of dense forest. The grooving and fluting of the rock over which the ice grinds is well shown by the uncovered portion where the fragments fallen from the *séracs* above are lying. On the extreme right may be seen the *nunatak,* which spilts the icefall into two parts (Refer to map opp. page 152, Vol. I., No. 1, Can. Alpine Journal). The appearance of the lateral moraine that has been left standing around this *nunatak* and its position with regard to the timber growing thereon, suggest strongly an advance of the glacier subsequent to the growth of the timber on the *nunatak.*

For Advance or Retreat.

To obtain some idea of the movement of the ice forefoot with reference to its position in the valley, measurements were made from Rocks Nos. 1 and 2, marked in July, 1906; and, also, from the "Sherzer" rock marked in August, 1904. The measurements were to the nearest ice and the results are not very satisfactory, owing to a considerable change in the structure of the forefoot during the twelve months elapsed since July, 1906.

Table Showing Measurements to Nearest Ice.

Point Measured From	1904	1906	1907
Rock No. 1, left side		27.5 feet	35.8 feet
Rock No. 2, left side		33.6 "	43.8 "
Sherzer Rock, right side	79.4 feet	79.6 "	123.0 "

The above measurements would point to a slight retreat. The greatest shrinkage appears to have taken place on the right side, indicating the withdrawal of

the ice to a distance of 43 feet further from the Sherzer Rock, although for the two years previous it appears to have been stationery at that point.

Annual Changes in Formation of Ice Forefoot.

A marked change had taken place. Comparison of photographs from view-point, 79.3 feet south of Rock No. 1 (illustrations Nos. 2 and 3) taken respectively on the 15th of July, 1906, and the 17th July, 1907, shows the change; and, very distinctly, the shrinkage of the forefoot.

It will be noticed that the two great cracks on the right of the 1906 picture are lacking in that of 1907; the further uncovering of the ground-floor may be seen in the centre of the 1907 picture; and the shattered and crevassed condition on the left where solid ice shows in the 1906 picture.

Comparison of the 1907 photographs, illustrations Nos. 4 and 5, with those taken in 1906 (opposite page 158, Vol. I., No. 1, Canadian Alpine Journal) from Rock No. 2 and from the view-point 6½ feet nearer the ice that the Vaux marks of 1902 disclose the change to a greater degree. In the first picture the disappearance of the two great cracks, the uncovering of the floor, and the shattering of the ice on the left-hand side is still more marked. It will also be noticed that in 1906 the stream was higher than at the same time in 1907.

In the second picture the pointed nose of ice seen lifted above the ground moraine in the 1906 picture is lying broken off and nearly melted away.

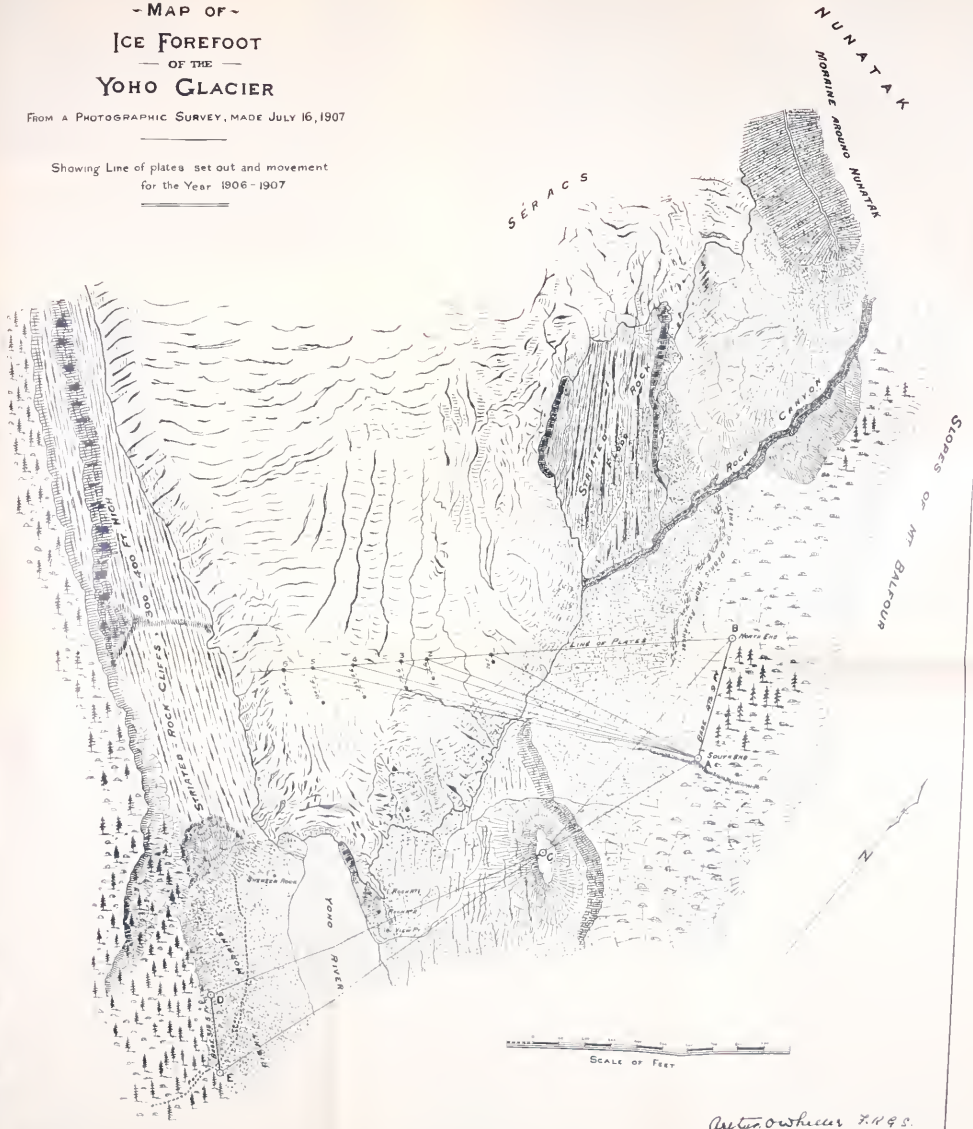
Survey of Ice-Tongue.

Having completed the above observations, several camera stations were occupied at suitable points to enable, by means of the application of photogrammetry, a map of the tongue of the ice forefoot to be made. The map herewith, which is from the views taken at the

Map of
Ice Forefoot
of the
Yoho Glacier

From a Photographic Survey, made July 16, 1907

Showing Line of plates set out and movement for the Year 1906 - 1907



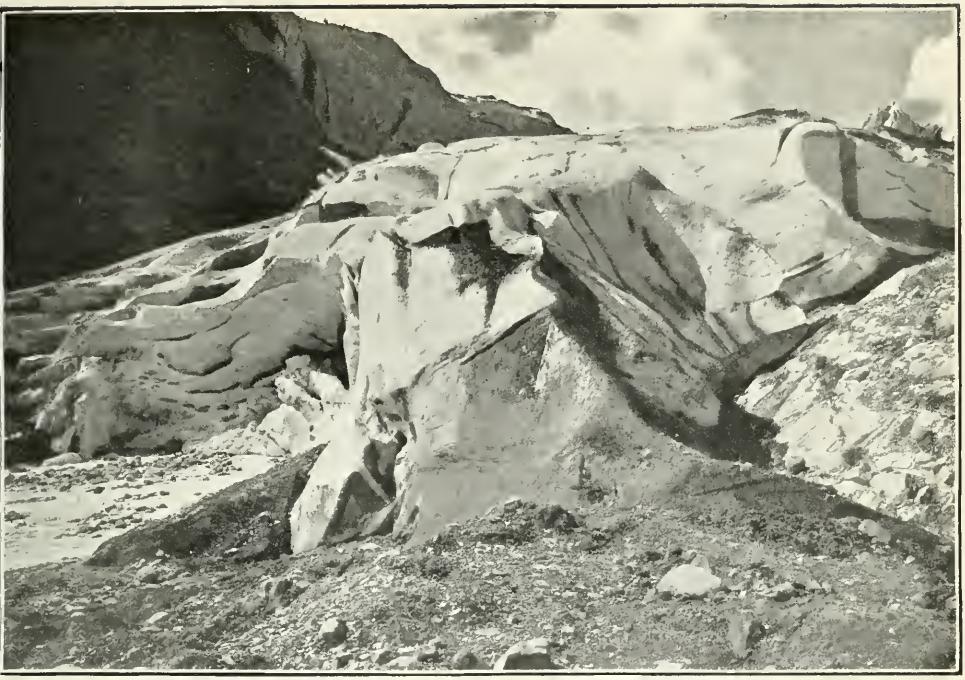
Arthur O. Wheeler F.R.G.S.
June 15th 1908

A. O. Wheeler, Photo

ILLUSTRATION No. 2.—FROM VIEW-POINT 79.3 FEET SOUTH OF ROCK No. 1—1906

A. O. Wheeler, Photo

ILLUSTRATION No. 3.—FROM VIEW-POINT 79.3 FEET SOUTH OF ROCK No. 1—1907



A. O. Wheeler, Photo

ILLUSTRATION No. 4

From Rock No. 2. Compare with plate opposite Page 158, Vol. 1, No. 1, Canadian Alpine Journal

A. O. Wheeler, Photo

ILLUSTRATION No. 5

From View-Point 6½ feet nearer ice than the Vaux marks of 1902. Compare with Plate 2, opposite Page 158, Vol. 1, No. 1, Canadian Alpine Journal.

several stations, shows the positions of these stations and of the rocks from which measurements were made to the ice; also, of the other view-points and the various features of the glacier in its bed. I now wish to acknowledge the assistance given me by Mr. M. P. Bridgland, who has plotted and computed the altitudes of all the points used in outlining the glacier and in drawing the contours here shown.

It may incidentally be mentioned that it is only by the means of the science of photogrammetry that in a single day—not taking into consideration the other work done when locating plates and making measurements, etc.—sufficient data could be obtained by two persons to map the tongue so completely and accurately, without making actual measurements, a process that would entail a considerable expenditure of time and labor. The process, combined with the views taken, enables, in this case, a large amount of additional information to be gathered, such as: thickness of the ice, previous thickness of the ice, slope of ground-floor, etc. It shows how valuable the method is for a survey of this nature.

From it we may gather that the approximate thickness of the ice on the right side is 170 ft., and on the left side 130 ft.; that the height of the cliffs from the ice to the lower edge of the upper growth of timber in illustration No. 1 varies from 300 to 400 ft., a depth of ice that once filled the valley; and that the slope of the portion of the bed beneath the ice tongue is approximately 35 per cent.

The general conclusion that may be drawn from the above is that the glacier receded during the year, July 1906 to July 1907, an average distance of about 20 feet and that the shrinkage of the ice in thickness on the right side has been very considerable. These evident facts appear somewhat peculiar in view of the unusually large amount of snow that fell in that locality during the winter of 1906-07.

MISCELLANEOUS SECTION.

PARADISE VALLEY CAMP.

By Francis C. Walker.

"Mr. Robinson! Is Mr. Robinson in this tent?" A very sleepy voice said something which might have been taken for a "yes." "Time for breakfast if you mean to make Mount Temple to-day. Party starts at 5.30 sharp." The sleepy voice gave a reply a trifle less like a grunt this time, and brisk steps were heard moving away from the tent. It was my first day in camp in the Paradise Valley, and I was just enough awake to rejoice that I was not in Robinson's shoes, while being still too much asleep to know whether it was my feet or Robinson's that were being pulled out of the pile about the tent-pole. I opened one eye and saw to my relief that a quite unfamiliar sock was being thrust into a stout hob-nailed boot. Evidently I had been left intact beneath the blankets, and could afford to take a spectator's view of any further preparations. I opened the other eye to see how he would manage the puttees, which he was now fishing out in suspicious newness from the dunnage bag. For the life of me I could not see that he knew any more about the things than I did. Possibly he knew less, for the right leg cost him three tries and the left leg two, while I flattered myself I could turn off the pair in an average of two attempts. Besides, the effect produced seemed all out of proportion to the cost of production in language, for the swathing was accompanied by a soliloquy whose depth of meaning made up for its lowness of tone. I intimated these views

"PLEASE SIR, MAY I GO WITH BILLY"?

MR. ROBINSON! IS MR. ROBINSON IN THIS TENT?

to Robinson, who took advantage of my waking to borrow a pair of warm gloves and to fish unsuccessfully for the loan of an ice-axe, an article evidently possessed by neither of us. There would be frosty weather on Temple—possibly flurries of snow; altogether Robinson at 5.30 a.m. seemed to look less cheerfully on the climb than he had done at 10.30 the night before. Finally he picked his way over the snoring mummies between him and the entrance, fumbled awhile at the fastenings, and crawled out, leaving a loose flap, past which the raw mountain air came sifting in.

Once Robinson's footsteps had died away I rolled my blankets tighter and tried to sleep. For a time I succeeded, but the open flap of the tent was in the end too much, and before a fair holiday rising hour I felt moved to get up and investigate the camp. My dim recollection of last night's arrival reminded me that I was a lodger in tent No. 5, Men's Quarters, south side of Paradise Creek. After wrestling with the puttees and crawling into the open, I found that tent No. 5 was almost the last from the bridge but at no great distance from the creek; and I soon washed and started out to find the main camp. All along as I made my way cheerfully over the stumps, guy-ropes and rocks that had treated me so scurvily the night before, I found other denizens of the men's quarters creeping out with soap and towel, or furbishing up their ice-axes and boots for the day's work. Crossing the substantial log bridge I reached the stopping place of the pack-train, where a number of the horses, just arrived from Laggan, were waiting to be unpacked. Before me now was the main encampment on the lowest slope of Aberdeen in a clearing hewn from the thick woods. Whatever it was hewn from I suspected it of holding a breakfast for me, and on I pushed through the tents. In another minute the breakfast was in view. Half way up what seemed to be the main street of the camp, and in the middle of

the street, was a huge strip of canvas flung over a stout horizontal beam and guyed down at either side; beneath were six tables made on a simple rustic frame with oilcloth tops and furnished along either side with stout log perches on which the second relay of breakfasters were already balancing themselves. Opposite every place there was laid an outfit of eating implements, consisting of one tin plate, one tin cup, one knife, one fork and one spoon. These must serve the holder for his entire meal, and later, as we grew accustomed to the etiquette, it was astonishing how simple and natural it seemed to save from the influence of porridge a place large enough for bacon, and to keep an unbaconized surface for final prunes or pie. At that, my first breakfast, however, I was hard put to it, what with the simplicity of the service, and what with my struggles to preserve the equilibrium of the porridge dish on the curving surface of the oilcloth, as well as my own on the diner's perch.

From the mess-tent to the cook-tent below was a short distance, and the speed with which the various courses came on was only equalled by the rapidity with which the food disappeared. The chief cook was Mok-Hen, an old retainer of the President, and familiarly known as Mock Turtle, who had under him two China boys from the Lake Louise Chalet. Mok and his staff served only eatables, tea being handed out by more or less active volunteers, from a small tent sacred to the ladies, which stood just above the mess-tent.

The mess-tent practically divided the main camp in two. It stood almost spanning the main street, with the cook-tent below and official tents above. To the right and on the same level as the mess-tent were the living tents of the President and Secretary, and beyond these, scattered along the woody mountain side, were the ladies' quarters. The official tents of the President and Secretary stood at the upper end of an open space, the forum of the camp. Of this space the most important part was a big

square of logs with the camp fire in the middle. Here every evening the campers gathered for song and jest, and here, during the day a succession of worried-looking ladies hammered nails, discussed sunburn cures, or fried out the interior of the boots thaty had used in climbing the day before. Not far from the camp-fire was a bulletin board fixed against a large tree and setting forth all the official announcements, especially the successive programmes for the following day. Altogether this year's camp to most of us, even the pioneers of 1906, seemed a model of good arrangement and comfort. The President, however, has in view for next year all sorts of improvements, among them a larger mess-tent and a more satisfactory tea-tent. The tea-tent is really sacred to the ladies, which means that they use it for drying their clothing, especially overflow boots from the camp fire. This system keeps out the mere males from the use of the tea-tent as such; but in future we may see a two-roomed tent with tea in the foreground, laundry at the back, and an entrance at each end. Why not go a step further and have bell tents with electric bells in them, buttless fir boughs, and porcupines furnished with hairpins as well as needles? I am at present working on a self-balancing, three-sided plate especially adapted to club use.

The camp, as it stood, represented no small thought and toil. To begin with, the late-lingering snow had made it necessary to abandon the first site chosen and move lower down the valley. This second site had to be in the thick woods, and a clearing was made only by three days' work on the part of a gang of men loaned by the C.P.R. In addition to the work done by this gang in clearing the ground and bridging the creek, a number of members of the Club worked hard for the first four days of July in setting up tents, cutting boughs and firewood, and doing a hundred and one tiresome, necessary things. Those of us who came after

and, like Kipling's "Sons of Mary" found the rough places smooth for our feet, owe a debt of gratitude to the hard-working officers of the Club who planned, and the unselfish volunteers who swung axes and stretched ropes for our comfort. The names of these, "The Sons of Martha," I could give—and would, were it not to save a blush in the cheek of the many lingerers. Even so I would venture to make an exception of the man from Woodstock if he had not been already overpaid for those four days; it was then that he thought out the great device for the painless ironing of rough-dried collars on a tent roof. One of the McTavish twins, too, would certainly have been mentioned—if I were quite certain which twin it was that worked. The wrong one would assuredly claim the credit, and he, as it happened, appeared in camp when the work was all done, and just as supper was served. I ought to know, for I came with him.

Life in camp was, to some extent, guided by the official bulletin. Every evening we could read the programme for the following day, consisting of two official climbs (one starting about 5.30 for Mt. Temple, another at 6.30 for Mt. Aberdeen), two forty-eight hour excursions starting at 10 a.m. (one for Lake O'Hara and one for Moraine Lake), besides several less arduous trips about the valley itself. In spite of these notices, no member was compelled to do anything, arduous or otherwise, during the day. Three meals were served for him at very elastic hours, and, beyond attendance at these, or not even including such attendance, he could spend his time as he pleased. I can at all events speak for there always being plenty of campers standing or lounging about to serve as artistic studies. There were always, too, plenty of people to welcome incoming campers or baggage when the saddle ponies or pack-horses reached us from Laggan. Such pastimes as porcupine hunting, wood chopping, patching "glissaded"

A FEW DENIZENS OF THE CAMP

clothes, mending tents, and drying out boots could be freely indulged; and only the most ardent mountaineers spent the majority of their days in actual climbing. I hope that all of us, as we idled about in camp or took advantage of the daily expeditions through the valley or over the mountains, thought occasionally of those who oiled the smoothly running machinery. How would you, oh Robinson, have liked the fun of running the President's office, sending off scores of glorious expeditions and never sharing one, appointing guides you might not follow and replenishing rucksacks for other mouths to empty? Or with what grace would you, Miss Vere de Vere, have sweltered with the Official Chaperone in the tea-tent, catering to the insatiate thirst of the camp and leaning on bruised reeds of Ganymedes, who often went to pour and remained to eat?

Here's a health (and we would drink it in that same tea) to the President, the O. C., the Secretary, and all our noble officers. Here's to the governments too, at Ottawa and Edmonton, who have so practically endorsed our work! And here's to that octopus of a railway company who "hewed timber afore out the thick trees," loaned us their guides, and sent us (at one fare) on our way rejoicing!

Of the official climbs, *i.e.,* the climbs by which graduating members were to qualify for active membership, that up Mt. Aberdeen was taken by the greater number. Every day from twelve to thirty persons ascended this mountain, which was right behind the camp and has a height of 10,340 feet. The earlier expeditions from the camp up this mountain were attended with some difficulty owing partly to severe weather and partly to the dangerous course at first taken. Your blood would run cold if I could repeat to you the horrible adventures told in tent No. 5 by the different gentlemen who took part in those first ascents. The ledges along which they walked for hours were never

wider than six inches, the precipices over which they hung suspended by a single rope were seldom less than 3,000 feet, and the general air of terror which enwrapt the whole performance almost robbed me of sleep on the night before my venture on the same mountain.

The next morning at seven o'clock a ropefull of us were lined up before the President's tent. Nine in all, we started off in charge of our guide without waiting for the sixteen others who were to make the ascent that morning. For the first half hour we tramped up a steep ravine. This seemed easy, though it was not long before it began to shorten our breath; the guide was ready for this, however, and made us sit down for a rest long before any of us would have considered it necessary. Once beyond the ravine and out on the rocks we began to do some real climbing. The easiest going was up the solid rock ledges; the most troublesome was over the great slides of shale, which, even when taken in zig-zags, gave at every step. The greatest care was necessary in placing the foot so as not only to assure your own advance, but to safeguard from sliding fragments the brains of the following climbers. We kept on over rock and snow, for we had now reached the snow-line, till we arrived at the base of a sort of tower of rock with a narrow ledge running round it. Here our guide halted and began roping. There were, as I have said, nine in our party, and after half a dozen loops had been made in the rope and slipped over the shoulders of as many people, it was seen that at least two would be left out in the cold. Some instinct seemed to tell me that I would be one of these heroes. Sure enough, it was to me that he first turned with a cheerful "I know that you won't mind going unroped." "N-no—it's not very dangerous, is it?" He reassured me and the other hero in such ambiguous terms that we followed the party with anything but heroic feelings. From the base of the tower we got into a snow-filled crevice easily negotiated

by a series of steps made by the feet of the preceding parties. At the end of this crevice we found ourselves, as it were, on the roof of the mountain. We were, however, not on the summit, which we saw to the left at the end of a narrow snow-covered crest. Up this crest we worked for some time, keeping at a respectful distance from its precipitous sides, and before long reached our goal, the cairn marking the top of the mountain. We were Active Members of the Alpine Club of Canada.

It was now almost twelve o'clock and the thoughtful guide took off his rucksack and brought out nine substantial lunches, the work of our friend Mock Turtle. The only drawback to our enjoyment was the lack of drinkables. Some of the party attempted sandwiches of snow and bread and jam, but with doubtful success. After lunch and a short rest we began the descent, not along the snow ridge, but straight over the mountain side, down the back stairs, as it were, the stairs consisting of a peculiarly long and irritating slope of shale. Besides the usual irresponsibility of this loose rock, it occasionally overlay smooth slopes of the firm variety, and several exciting slides added interest to the descent. Finally to our relief we arrived at an oasis of firm rock. Stopping here for a rest we were soon joined by the second party, and then prepared for the most exciting and most enjoyable part of the whole trip.

Below us was a long, smooth slope of snow extending, as our guide said, for nearly 3,000 feet. This we were to travel by the simple process of glissading. Glissading is, roughly speaking, tobogganing without a toboggan. The glissader simply sits down, put his feet firmly together in front of him, draws a long breath, and starts, guiding his way with alpenstock held firmly under the arm. As one who knows, I should like to say, that the only safe from of glissading is "independent firing." On this occasion we were beguiled into

forming a combination toboggan of sixteen persons linked together by interlocked arms and feet. At a signal we pushed off and began to whiz down the snow slope. For a time all went well. Suddenly some projecting foot caught in the snow, the human toboggan split in two, and the part in front of me continued on its own responsibility. My section, however, came on with terrific impetus, and in their efforts to pass me while still holding on to me, forced my head and shoulders into the snow, and described over me a parabola which must have filled with joy the hearts of the onlookers. After we had gathered up our limbs, alpenstocks and ice-axes we continued our way in strictly independent fashion, and really enjoyed the long slide to the bottom of the snow-field.

The rest of the journey to camp was an easy scramble down the ravine, and we soon arrived rather wet and weary and quite ready for the usual afternoon tea.

For my part, when I have climbed a mountain, I like to sit down for a while and think about it. Yet you will see people coming back into camp with half the nails gone from their soaking boots and with a considerable gap in the garment that bears the brunt of a glissade, who will at once rush to the bulletin board hunting for more trouble. What are you to do with people like that? Mild cases are often satisfied with an enrollment for an ascent of Mt. Temple (11,626 ft.) on the opposite side of the valley, but for others this is as nothing; and for these the President unfalteringly prescribes a two-day trip. To grasp the psychic value of a two-day trip you must understand that the Paradise Valley is a narrow playground running for some six miles north-east and south-west, fenced on the south-west by a wall of rock one mile in height, and on the south-east and north-west by similar walls of from half a mile to one mile in height. Unfortunately no

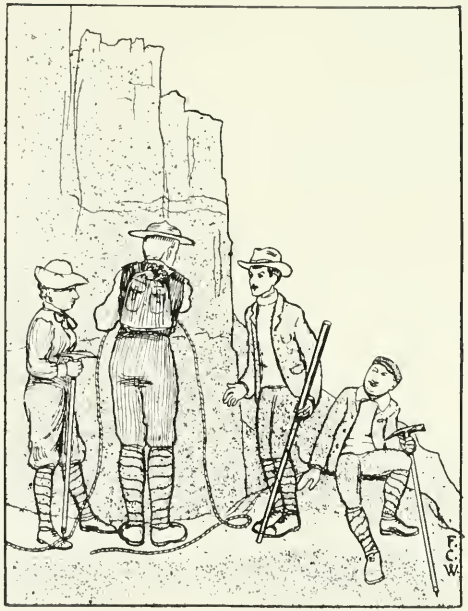
gate has ever been built at the front, and there are besides four places where you can climb over the walls. Now your two-day trippers are a sort of restless youngsters who want to see what the outside of the walls looks like. So the President says: "Certainly, my boys. I can put you over, Jimmy, by that gap on the north-west and you can walk along to the corner and down the south-west side and come back into the yard again by a gap you will find on the south-east. And you, Billy, if you like, may go out by the gap at which Jimmy is to come in and inspect the outside of the south-east fence till you come to the front, where you can easily come in by the gateway." Then he looks down and sees a very small boy. "Please, sir, may I go with Billy?" "Oh, no, my little man, that would make you too tired, and besides, Freddy, you might tear your clothes getting through the fence. But here's Mr. Holmes starting out through the gateway to take Billy's blankets to the place where he must stop tonight. How would you like to go along with him? He will take your blankets, too, if you ask him, and when you are tired he will let you ride on one of those nice ponies. Then tomorrow you can come back with Billy?"

All the boys jump at the chance. Jimmy climbs up from the valley, into the Mitre Pass, slides down that to the Lefroy Glacier, picks his way round the corner of Lefroy to the Victoria Glacier, and pushes upward to the Abbot Pass. If he escapes an avalanche in the Death Trap he passes Lake Oeesa, and at the end of the day staggers down to Lake O'Hara at his first fence corner, wondering if the supply of beans and bedding in the rest-house will meet his needs. However, the rest-house, conducted by a gem of cooks and with a base of supplies at Hector on the C.P.R., makes a new boy of him and sends him the next morning through Opabin Pass into Prospector's Valley, then round his second corner by way of Wenkchemna Pass

and Wenkchemna Glacier till he sights the two gaps in the south-eastern wall—Wastach and Sentinel Passes. Through one of these he scrambles into our Happy Valley. Meanwhile Billy has made his way over Sentinel Pass to Larch Valley, and thence down to the camp at Moraine Lake in the Valley of the Ten Peaks. Here he finds Freddy and the blankets, brought round by Mr. Holmes. Next morning they take a side trip up Consolation Valley and later in the day push along the south-eastern wall till they can come round the end into the Valley.

That many campers should look with favor on two-day trips is no surprise to me, for my own feelings in the matter may be partly hereditary prejudice. An ancestor of mine, many thousand years back, lived with his wife in a Paradise Valley of their own. One day they allowed themselves to be assisted through the gateway—presumably on a two-day trip—and none of the family have got back into that valley since.

In the modern Paradise Valley, at any rate, there was plenty of enjoyment for the one-day tripper, the man who liked to start off, not too soon after breakfast, in the wake of a well-filled rucksack, to reach at noon some remote part of the valley appropriate to the emptying of rucksacks, and to stroll back into camp with unexhausted frame in good time for the evening meal. To begin with, he could push up to the head of the valley as far as the Horseshoe Glacier, to feast his eyes on the towering snow-decked masses of Hungabee, Lefroy, and the Mitre. Or he could stay half way where the ice-fed waters of Paradise Creek come tumbling down the rock structure named not inaptly the "Giant's Stairway." Or he could follow the Larch Valley between Temple and Pinnacle to the summit of Sentinel Pass and after "rucksacitating" the wants of the inner man, could glissade homeward down the slope that so nearly finished our friends the Physician and



ROPING-UP ON ABERDEEN

THE PERILS OF SENTINEL PASS

the Habitant. Or he could wander down the valley and climb up to where little Lake Annette lies a blinking emerald eye under the shadow of Mt. Temple.

Sad that none of us can stay in our Paradise Valley forever. Is it our battered boots and our glissaded nether garments that clamor for repair? And, now that I bethink me, it was some question of clothing—that and fresh fruit—that took my ancestor from his Paradise Valley. Look as long as the daylight lasts at the beautiful mountains, sit as late as you can about the camp fire, there must come an end. Already one roll of blankets has gone from tent No. 5, and more are to go. You have sat at the Annual Meeting in the firelight, you have heard the wit and wisdom of the "Alpine Herald" recited in the same magic light, you have taken your last mouthful of Mok Hen's bacon. Pack your dunnage bag, man! Roll your blankets! Hit the trail! As you mount the rise at the valley's mouth and turn for one last look before striding off for Lake Louise and the Outside, you seem to see across the entrance a flaming sword turning every way—or is it only the sunlight glancing from the snows of Hungabee?

UNTRODDEN WAYS.

By Mary T. S. Schaffer.

In the summer of 1907, on June 20th, two women and two guides left the little station of Laggan, Alberta, and started for the vast wilderness to the north. It was cold and raw, snow flew in our not over-jubilant faces, the way was one of grind over fallen timbers and through the most discouraging muskegs. For our trail lay up the Bow Valley, across the summit of the same name, down Mistaya Creek to its junction with the Saskatchewan River, and from thence on by the various branches of the Saskatchewan and Athabasca Rivers.

Not as the crow flies, but as the trail winds, we reached in our wanderings a point about 200 miles from Laggan, not far from the junction of the Whirlpool and Athabasca Rivers. In this section there are four distinct streams: the Chaba, which flows up from the south and joins the West Branch of the Athabasca about twelve miles from its own source; a branch which flows from the south-east and joins the Chaba about three miles from the latter's source; the West Branch mentioned above, and the Sun Wapta, which joins the main stream several miles below. About half way up the Chaba, and to the west of it, lies beautiful Fortress Lake, discovered in 1893 by Dr. A. P. Coleman. It is a wild and strikingly picturesque valley, though probably not more so than many similarly situated on the Saskatchewan River. Yet the West Branch appealed to us more; there was a sense of loneliness, of freedom from all touch of human life, a purity, a bloom, which the white man's hand so quickly brushes aside. I say "white," for the red man defiles it no more than does

Mary T. S. Schaffer, Photo

FORTRESS LAKE

Mary T. S. Schaffer, Photo

MOUNT COLUMBIA

the passing caribou or the wandering bear. His standing teepee-poles but give the touch the artist loves, while the centuries-old hunting trails are filled with soundless stories which interested eyes may easily read as they follow in the wake of the feet that have gone by and will never return.

As far as I can learn, only one white man has ever penetrated to the end of the West Branch, and this was Jean Habel, a German explorer, who visited it in the summer of 1901. He did not then recognize the superb pyramid of faultless outline which stands guard at the extreme southern limit of the valley as Mt. Columbia, and called it "Gamma." He afterwards published a short article in "Appalachia" with a fine reproduction of Mt. Columbia, but before he could do more, or his work be better known, the pen was laid aside forever; and it was with a feeling of sincere sadness that we passed his long-deserted camps, and realized so vividly the feelings which must have thrilled him as he saw the rich scenic treasures the mountains were unfolding for the first time to human eyes.

Next to being asked if we were not "afraid" in that lonely wilderness, the most common question is: "Did you go where no person had ever been before?" An Indian after all is a "person," and to find a spot where an Indian has not been in that great hunting ground, which has doubtless been hunted over from time immemorial by the plains tribes, would seem an absolute impossibility. The caribou, goat and sheep yet wander in these lonely fastnesses, and a few Indians still come to the haunts of their forefathers; but in the further valleys the teepee-poles are fallen and decayed, and thus the story of the passing of the red man is simply and sadly told. So to that question I can only reply: We found one section, and but one, where it seemed as if not even an Indian's foot had trodden. This was on the north shore of the Athabasca River after the four

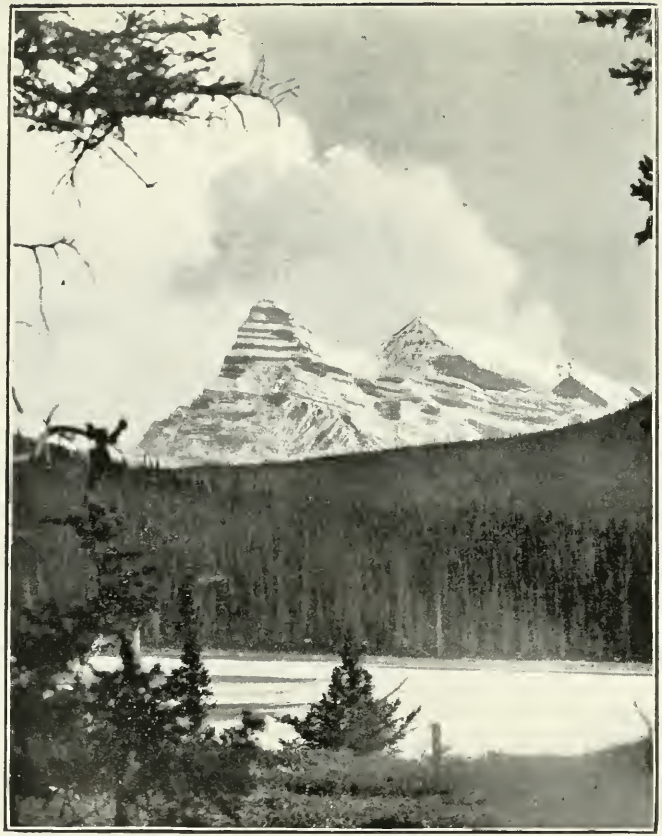
streams had united. The original explorer had chosen the south and more "muskeggy" ground, where we ourselves were forced to travel to avoid the arduous labor of chopping a trail. This was the only section of the eight or nine hundred miles we travelled where there was a doubt that Indians had gone; at least, it had never been a highway.

From the Athabasca we turned our attention to the sources of the Saskatchewan and Brazeau Rivers, to the "Valley of the Lakes," a branch of the North Fork of the former stream, and to the West Branch, a tributary of the Saskatchewan flowing from the Lyell group. This valley alone is worth a trip, an article to itself, and a more ready pen. It is a valley of gorges and glaciers, magnificent peaks and tumbling waterfalls, and holds a charming lake which we have named "Nashanesen."* The climax is reached at the Thompson Pass, where the traveller who has stuck to it through pretty rough "going" is at last rewarded by his first glimpse of Mt. Bryce, and from a shoulder of the mountain the vast ice-fields of Mt. Columbia.

From the West Branch we crossed by Nigel Pass to the Brazeau country lying to the north-east of the Wilcox Pass. Roughly speaking, Brazeau Lake lies in latitude 53° and longitude 117°. It is about six miles long, is wooded round its shores, and at its head stands a fine peak—Mt. Brazeau. Low mountains hem it in on all sides, and, on a calm morning, before the sun has risen or the wind has cast a ripple on its blue-green surface, the sight is one of exquisite beauty.

We no sooner reached the southern shore of the lake than a whole volume was opened for us to read. In a perfect grove among the spruces stood comparatively fresh teepee-poles, while tossed here and there, in every stage of decay, were those which had served their pur-

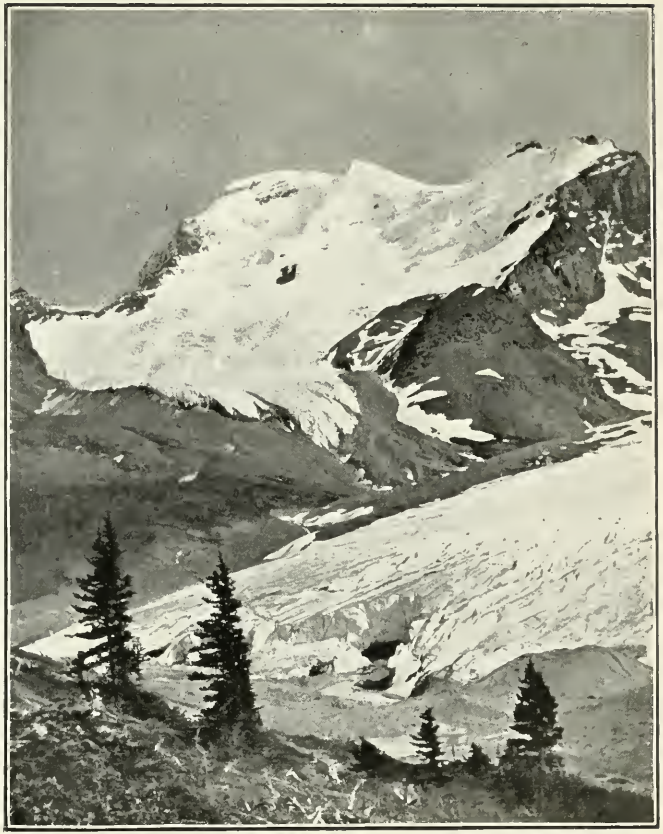
*Names given in Canada are subject to approval by the Geographical Board.—Editor.



Mary T. S. Schaffer, Photo

PYRAMID PEAK

From Junction of North Fork and Main Saskatchewan



Mary T. S. Schaffer, Photo

MOUNT ATHABASCA

From Wilcox Pass

pose many, many years before. An old trail was beaten deep within the forest, and from this path sprang ancient trees which held their proud boughs to the blue sky above, their lower bark scarred and gashed by hands long laid beneath the sod.

That it was and yet is a magnificent sheep country, there is little doubt. Its long distance from the now small band of Stony Indians at Morley and the nearly exhausted game country intervening, is probably a sufficient reason for the greater abundance of animal life which we saw there. We had followed a most marvellous Indian trail over the worst bed of boulders I ever met for horses to travel, had climbed on and on, lured by the old trail, until well toward 9,000 feet, when we suddenly surprised a band of sheep. They had probably never seen a human being before. On the defensive at once, they were off like a flash before our astonished gaze, along a bare rock-face and up an almost perpendicular wall covered with ice that the most fearless Swiss guide would not have dared attempt, and over which they bounded as though it were but a meadow of upland grass. Reaching the high and inaccessible crags, they paused, and for a moment gazed upon us far below; then a magnificent ram appeared to take the lead. The others disappeared, but the massive head of the leader, with its great horns, stood motionless against the grey sky, his attitude alert, his body immovable. Only, as we moved back and down the valley, we could discern that he turned to keep us in view. Such a picture! The dreary wastes of naked rock, the cold glistening glaciers all about us, the early snows in the unexposed niches, the dying alpine flowers at our feet, then, high above, clinging to the superb crags outlined against an angry sky, stood that emblem of a noble and fast-disappearing creature—the Rocky Mountain sheep.

From the Brazeau country we made our way back toward Nigel Pass, crossed Cataract Pass and descended

Cataract Creek to the Kootenai Plains. Here we rested and revelled in those golden valleys, visited the Indians, and found life a very pleasant matter in that peaceful sunshine after the snows and storms among the more northern valleys.

Yet even here the late September days were stealing. They were coming with the yellowing poplars, and with the laggard dawn. We knew the winter's snows must soon sweep across the higher passes, but begged a few days' respite to visit one spot which beckoned us with its beguiling name. This was the "Valley of the Lakes." James Outram speaks of seeing it from the summit of Mt. Lyell, and says in his book (*In the Heart of the Canadian Rockies*): "It appeared as a deep enshadowed trough, jewelled with a host of little lakes." The description fascinated us, appealed to our imagination, and we were to have the pleasure of stealing the first secrets of a primeval wilderness. From the camp at the junction of the North Fork and the main Saskatchewan River, we travelled up the east bank of the North Fork for about 13 miles; here, being low water, we easily found a crossing, and followed the west shore for a mile more, when an old Indian trail led directly to the unknown valley. As far as the red man is concerned, it is many years since his moccasined foot has trodden that moss-covered way. The trail remains beaten and worn, but overgrown and impeded with huge fallen trees, and only the blaze of a white man's axe seven or eight feet above the ground showed that a hunter had gone that way in the dead of winter to test his fortune with traps and rifle.

No sooner had we left the river than we plunged into a thick growth of spruce, climbing constantly for two hours. Reaching comparatively level ground, we plodded on amidst closely grown and exasperating pines, so thick and so nearly impregnable that even our now depleted packs could not be forced through until the

axe rang and woke the silence which seemed to lie like a pall on every surrounding object. So muffled and dark and still was this bit of primeval forest that no sign of life met us on the way; it seemed that with the passing of the Indian had passed the need for the little people of the wood; and yet, no doubt, bright, terror-stricken eyes were in every direction, watching the movements of the terrible and unaccountable enemy.

After long windings and turnings in the shadows, with no sign of the grass so necessary to our horses, we made our way to the banks of a tumbling torrent which seemed to come from the Lyell ice-fields. From the deathly silence of the forest, our serenade all that night was the rushing, pounding stream as it hurled itself along among the boulders of the river-bed scarce ten feet away. On each side of the very narrow valley avanaches had torn and ripped the trees from their roots in every direction, and amidst this havoc and desolation was the only feed our hungry horses could find, and very poor picking at that. As yet we had seen nothing of the lakes to which Outram had given the lovely name, the name which had lured us through those long, silent, weary hours in the deep, lonely forest.

In a rainy, misty sort of sunshine the next morning, we essayed a climb to look for the lakes. How hot it was when the sun beat down! How steep and tough the avalanche-scarred hillside! How bitter cold the wind from the ice-fields! And our reward, "the lakes like jewels," where were they? Toiling stubbornly onward to the bare cliffs above, we reached the loose unstable scree just beneath them, paused and looked eagerly to the valley below upon a chain of sloughs. Beautiful they were, too, lying in peaceful silence far below, like giant emeralds tossed there by mountain gnomes. From his height of several thousand feet above us the enthusiastic climber had beheld "lakes."

The home stretch lay over Howse and Baker Passes, the latter very beautiful but difficult to travel. It is hard, at best, to leave behind the days of freedom, the constantly shifting panorama of mountains, lakes and rivers, the balsam-laden air; to return to the beaten track, to four walls, and all the cares which know so well how to creep within them. It was a summer of almost continuous cold and storm, but with no accidents to ourselves or the horses. It was a happy sixteen weeks amidst as fine a cyclorama of changing scenery as the dear old world can offer, and there was always the sunshine of contentment and goodwill within the tent and at the camp-fire.

THE ALPINE CLUB'S JUBILEE.

By Arthur O. Wheeler.

What was the Jubilee of the Alpine Club? It was the celebration of the fiftieth birthday of the oldest of such organizations — the Alpine Club of England. Founded in 1857, this Club has become famous the world over for its thrilling feats in mountain conquest, its records of scientific exploration among the high places of the earth and its introduction of art into the regions of snow and ice.

While the second Annual Camp of the Alpine Club of Canada was in progress, during July of 1907, an invitation was received by the President to attend the Jubilee Celebration. It was accepted, and thus the honor of representing our youthful Alpine Club, the Canadian Rocky Mountains and Canada at this gathering of the clans from all lands, far and near, devolved upon the writer.

The celebration may be summed in a sentence: It was a gathering of the foremost men of the world interested in mountain regions from all except the mercenary aspect, and a review of the foundation and past history of the Club.

For the information of our members, a few words as to its origin and early life may not be amiss. In an address to the Club by its President, the Right Rev. the Bishop of Bristol, delivered at the Winter Meeting, December 16th, 1907, he makes the statement that "the University of Cambridge had the predominant share in the formation of the Club and its earliest activities in literature and art as well as in the world of ice, rocks and snow."

The President had for thirty-four years been a "devoted son" of that University. Whatever rival claims there may have been to predominance, it is a fact that the first proposal for the formation of an Alpine Club emanated from William Mathews to F. J. A. Hort, both high up in the highest honors of Cambridge, the latter during the years 1850 and 1851 carrying off three out of the four Honour Triposes and coming out as Third Classic. In the formation and detail, F. Vaughan Hawkins and Dr. Lightfoot took an active part. Both were Senior Classics and Wranglers.

According to an article devoted to the Jubilee Celebration, appearing in the Graphic of December 14th, the Club was founded at a meeting at Ashley's Hotel on 22nd December, 1857. The articles goes on to say: "It was greeted with a storm of ridicule. The press pronounced it to be an association of suicidal monomaniacs, and Ruskin uttered a wild protest in which he declared that 'the Alps themselves, which your own poets used to love so reverently, you look upon as soaped poles in a bear garden, which you set yourselves to climb and slide down again with shrieks of delight.' But the storm soon blew over. Ruskin himself found that men might climb mountains without vulgarising them, and gave practical effect to his recantations by himself joining the Club."

From an original membership of thirty-one, it has gradually advanced in the fifty years of its life to some seven hundred. The membership is small compared to that of other clubs since formed, whose members are in the thousands, one of them, the German-Austrian, boasting of more than seventy thousand members. The reason for the comparatively small membership is due to the very high standard set and maintained by the Club, and the great care with which applicants for membership have been selected. This fact is well illustrated by the names of now famous men which appear

in the first list of members, published in 1859, when the dimensions of the Club had swelled from the original thirty-one to one hundred and thirty members.

In glancing over this publication, a copy of which has been presented to the writer by Mr. Edward Whymper, such names as Matthew Arnold, John Ball, E. F. Blackstone, Rev. T. G. Bonney, Joseph Chamberlain, Rev. J. L. Davies, Rev. F. J. Hort, William Mathews, John Murray, Rev. Leslie Stephen, Prof. J. Tyndall, Alfred Wills and Horace Walker appear, names of young men who have since risen in their various departments to the highest fame and greatest responsibilities that can be acquired. With mental power and physical energy of a calibre such as these names indicate, it is not difficult to understand why the Mother Club stands to-day on a pinnacle whose heights have been climbed by her alone. It shows most conclusively that of all noble sports, that of mountaineering is most noble, in that it appeals to all classes and professions and brings forth the lofty traits of patience, perseverence, courage and skill. It has, moreover, much to do with the formation of a nation's character, in the development of the intellectual and religious senses, the former through scientific inquiry and artistic representation, and the latter through the unseen but much felt force of an Almighty Power behind an apparent chaos, evolving a scientific scheme of order and an artistic blending of color. An alpine club built on lines similar to the Mother Club is a national asset of which a country may well feel proud.

From the parent club has sprung a large family, one hundred and sixty-six in number. While many of these are, properly speaking, tourist associations rather than actual alpine clubs, yet the same keen activity, the same spirit of emulation and the same desire to come in touch with the cruder forms of nature is the mainspring of each organization.

The constitution of the Alpine Club does not admit of women members, and, though the climbing record of many is on a par, if not superior to that of the average member, they are without the pale. It was, therefore, somewhat of a satire that, on the very night of the great dinner to celebrate the fiftieth anniversary of organization, a women's club should have been formed in London; thus putting the nose of the Alpine Club of Canada "out of joint," previously the baby and flower of the flock.

The most attractive and important features of the Jubilee Celebration were an exhibition of alpine paintings and drawings by past and present members at the club rooms, from December 10th to 28th, and the now historic dinner of the 17th December, 1907.

The former comprised a very fine and, to a stranger, instructive collection of mountain paintings. The representations were chiefly from the European Alps, the Himalayas, the Caucasus and the Andes. Of the first, Mont Blanc, the Matterhorn, the Wetterhorn and the Breithorn stood out conspicuously. Among others, striking pictures were shown of Mt. Everest and Aconcagua. There was also a representation of Fujiama; and even of Mt. Ararat.

Among the member-artists whose works were contributed figured the names of Ruskin, Watts, Loppé, Alfred Williams, McCormick, Sir J. Collier, Franz Schrader, Elijah Walton, and Willink. There were besides numerous pen and ink sketches, both humorous and descriptive. Taken as a whole, the several hundreds of paintings and drawings presented a collection of incalculable value; not only that it was a rare exhibition of art, but also from its association with members who had "done things"; and as an important series of links in the history of the Club, showing not alone the evolution of art in mountaineering, but the evolution of mountaineering itself.

The dinner was held in the historic hall of Lincoln's Inn, loaned by the Benchers for the occasion. Although a room of vast proportions, the three hundred and fifty-odd guests did not seem to fill it, and in the gloom beyond the brilliantly-lighted tables there was plenty of space. The walls were hung with portraits of by-gone Chief Justices whose names are famous in the pages of England's history, and at the President's left hand, among the honored guests, sat the present Lord Chief Justice.

The gathering was a most remarkable one in that it represented the Church, the State, the Navy, the Army, Science, and all the learned professions in a very high degree. Numerous stars, orders and ribbons scattered through the assembly showed that many of those there had made their mark in their respective callings.

The dinner was the best London could provide, and was served in a style for which the Alpine Club is famous; but the supreme charm of the entertainment lay in the speeches, which were terse, brilliant and witty, and full of a pleasing reference to the history of the Club. A few extracts from them will serve to give point to our own existence, the objects and aims we have in view and the trials of infancy.

In proposing the toast of "The Alpine Club" the President said: "I find an extract which I should like to read to you, dating from the year 1854; it was an early time in the history of climbing, but I am privileged to say that this was not written by Sir Alfred Wills. This is the extract: 'It is a somewhat remarkable fact that a large proportion of those who have made the ascent of Mt. Blanc have been persons of unsound mind.' (Laughter). That, my lords and gentlemen, was no passing jest; it was in the sixth edition of Murray's 'Guide to Switzerland.' I take it that the fact was this—the writer himself had done it—(Laughter)—and he generalized from the one to the many,

hence this remark. Having himself the curious mental twist he has described, he took a well-known proverb, transposed the word *in,* and changed the construction into *mens insana, corpore sano.* (Laughter). Of course he was speaking about the danger of the ascent as it was then."

Speaking of the care taken by the Alpine Club to obviate danger in climbing, he remarked: "I have had sent me reproachful cuttings from newspapers month after month in the season, with 'What do you think of this, President of the Alpine Club?' written upon them. (Laughter). I find this sort of thing: a party of three has been lost; one was a shoemaker, another a waiter, and another a student of the age of sixteen; that is the sort of thing with which we are reproached. With regard to the Club itself we are in this position: People talk about the danger of going without guides. Now, in the list of qualifications for entrance to the Club applicants frequently state that certain of their ascents were made guideless. We found that to be of very little real use as evidence, because so many members of the Alpine Club are at least as good as guides. We are now obliged to ask, 'Who was your companion when you ascended guideless?' (Laughter). The committee has had to make that change in very recent times. That, I think, may be a useful hint to those who are not exactly of us this evening, how very much the Alpine Club has succeeded in eliminating the element of danger. There are, of course, heaps of places where if you do slip there is probably an end of you; but the Alpine Club knows so well how to negotiate these places that in the last three years, and for some time before that, I am glad to say there has not been a single accident to any one of the six or seven hundred members of the Club." (Hear, hear).

During the course of his speech the Bishop of Bristol read a note of congratulation from President

Roosevelt which concluded as follows: "I have always peculiarly prized my honorary membership in the Club, for not only has the Club itself done a great work, but it has set the standard for all similar organizations in all other countries, and its example has counted much in many fields other than those of strict mountaineering."

Continuing the Bishop said: "Now, my lords and gentlemen, I should like to take as the text for a sermon as short as I can make it Theodore Roosevelt's remark that this club has set an example in many fields other than those of strict mountaineering. I should like to read to you—many of you may have forgotten this—an extract from the form of application for membership in the club: 'The applicant must send a list of his mountaineering expeditions or a statement of the amount of contribution to Alpine literature, science, or art, upon which he founds the claim for membership'—not strict mountaineering, you see, but a good deal that is outside that."

Again speaking of the contributions of Alpine men to the letters of the day: "With regard to literature, is it surprising that Alpine literature should be of a very striking kind? I think it is not. Beginning with Sir Alfred Wills, and even some before him, and going on to the list of other delightful writers—we can never forget 'Peaks, Passes and Glaciers'—they have been men of observation in many scenes of quite unrivalled beauty; not only of unrivalled beauty, but of mystery—a solitariness—a mystery that always makes an impression upon the sensitive mind. But more than that, anything that the skilled Alpine climber does must be virile and strenuous. Therefore you have thoughtful, imaginative, strenuous, virile literature as the natural literature which comes from the Alpine Club. (Hear, hear). It has been—I was going to say my duty—my pleasure to look once more at some of the literature which Alpine Club men have put forth to the world, apart from

descriptions of mountaineering efforts. I have been very much struck indeed with one of the earliest of the important works to which I refer; I mean Mr. Whymper's great book on the Andes. (Hear, hear). That book is a marvellous collection of archaeology, history and science of all kinds—geology, petrology, entomology, and all sorts of things; excellently put as literature, and accompanied by abundant evidence of, I suppose, about the most skilled power of illustrating man ever had. (Hear, hear). There is nothing like Whymper's illustrating, I think, done by the mere hand. He makes noxious insects much more real than life. There is one standing prominent in the middle of a page, the most dangerous, poisonous, mischevious beast that is to be found in the whole of the Andes. I regret to say that the natives call it the 'Bishop.' (Laughter). A few pages on he describes another formidable stinging beast, evidently only less bad than the 'Bishop.' This the people call the 'Devil.' (Laughter). The libel stands in the latest edition."

Again: "Here is Conway, going wherever there is anything to be seen that other people have not seen, describing it in a wonderful way, taking about with him men who can produce those marvellous photographs of mountain scenery accessible and inaccessible. The Alpine Club has done at least as much as any to bring about that development to the very height of perfection which has now been reached by photography in mountain scenery. Here is Conway, conquering unconquered mountains, and describing it all in so fascinating a way; and the mystery of it is that he makes it all seem so easy, though he confesses now and then that it is not always pleasant. He, too, is everywhere, not in literature only, but emphatically in art, very much more than a mere mountaineer."

Passing on to science: "What a chance the Alpine Club men have always had in the direction of science.

They have had to examine the effects of rain and rivers, frost and fire, ice and snow. All the elements that have produced the present configuration of the earth's surface are familiar to them, and in fact to all of us who have climbed the Alps with our eyes open—a normal condition of the Club's eyes, whether its members are scientific or not scientific men. By no means all of our best climbers have cared much for the science of the Alps. Leslie Stephen once made a scientific report on the state of the atmosphere at a certain time earlyish in the morning. An early morning start, after a night on some hard material, was not his best time. I remember once moving up to him, about half-past two in the morning, and saying something genial. He responded with: 'If you think I am such a fool as to be in a good temper at half-past two in the morning, you're very much mistaken.' (Laughter). Well, Leslie Stephen once made a scientific report on the state of things he found at the top of a peak. It took this form: 'If there was any ozone in the atmosphere, ozone is a greater fool than I take it to be.' (Laughter) That sort of thing is not confined to Alpine Club men. For example, we have with us here tonight Sir George Darwin. Sir George Darwin had a father. This was a remark made by the first lieutenant of the ship 'Beagle' to Darwin, who was engaged in dredging, and no doubt was making a great mess on the decks: 'If the captain would leave me in charge of this ship for one day I would have you and your filth overboard in five minutes.' (Laughter). The latest instance of the scientific nature of the Club is very interesting. It is this: The University of Oxford has given the degree of Doctor in Medicine to a member of this club, than whom none has a bolder record as a mountaineer, for a highly scientific treatise on mountain sickness. (Applause). Some of our visitors who have not seen Dr. Longstaff's treatise may not know, perhaps, that the com-

pound word 'mountain-sickness' is not formed on the same plan as that very nice word 'home-sickness.' (Laughter).

With regard to art: "Is it possible that Alpine Club men can climb as they do without breaking out into art, if they can use their fingers at all? Why, our club rooms are at this moment crowded and overcrowded with examples of the art of members. Nothing but the work of a member has been admitted there at all."

Finally: "What about Alpine work as an old man's memory? Well, just this: It is clean and wholesome, pure and unselfish, from one end to the other; there is nothing like it. Just think of the recollections of companionship. You have a jovial, genial companion for a week; you give him chaff and he probably gives you more in return; and so you go on as if the whole thing was just a happy lark. Suddenly there comes a crisis. In a moment your companion is like a steel spring, instinct with keenness of mind. He knows exactly the right thing to do, and exactly the right way to do it. Many and many a time that steel spring, instinct with keennes of mind, has saved a valuable life. And at the end when the time comes to shake hands and say 'Auf wiedersehen,' not one word, not one glance, throughout the whole of the week that either has reason to regret. (Applause). That is the sort of thing we old men have, recollections of things like that. You younger men, not perhaps of the club, get this, that and the other in your course through life, but with all your getting get clean memories for your older age. (Applause).

"We have heard a good deal of late of Honours Classes. I am not going to put the Alpine Club in the first class of clubs, or of sports. There is one word that has only once been used in all the centuries of honours of the University of Cambridge. Far above all

First Classes I place our club; with this one word written over it, the word that has only once been used in all the centuries of honours of the University of Cambridge—*incomparabilis.* (Applause)."

I have quoted largely from this speech because from beginning to end it is a masterly pronounciation. It is a sermon worth the hearing, and compresses into a few terse sentences the objects, aims and possibilities of an Alpine Club, as a mold in which to form a nation's character and comprise within it all the high moral, scientific, artistic and literary attributes that go to make the life of a nation or of a man beautiful.

Mr. Hermann Woolley, the President-elect—who, by the way, has spent a summer exploring and climbing in the Canadian Rockies—in replying to the toast of "The Alpine Club" said among other remarks: "Brilliant work has been done by those members who delight only in guideless climbing. Some of these gentlemen even disdain the services of the harmless, necessary porter, so successfully have they adjusted the weight of their equipment to the fewness of their wants. Whatever may be the disadvantages of guideless climbing, one thing may be said in its favor. When two or three men have climbed habitually together the safety of each one constantly depending upon the skill, judgment and watchfulness of his companion or companions, I believe that a feeling of confidence, sympathy and friendship must spring up between them strong enough to outlast all the wear and tear of later life. Last night's meeting impressed upon me the great development that has taken place within recent years in the Club, and also the value of the possession it has become to us. There is, I think, in one of Thackeray's books something to this effect: that we ought to cherish with gratitude and reverence a wine of noble vintage carefully laid down by our wise forefathers at a time when we were intent on childish things. In the same spirit we ought

to cherish, and do cherish, the heritage that has been handed down to us by the climbers of the fifties and sixties in the records, traditions and literature of the Alpine Club." These are words of wisdom, and are good to meditate upon.

Mr. Clinton Dent, replying to the same toast, traced the history of the Club from its first home in Hinchliff's chambers in Stone Buildings, Lincoln's Inn, to its present comfortable and suitable quarters at 23 Savile Row. He said: "The club has often changed its home; it has never, thank Heaven! changed its character. (Hear, hear). From our rooms and from our present habitation we may have to pass elsewhere. Much water has flowed under the bridges since the days of our first President, John Ball, and much has been done since Wills ascended the Wetterhorn and crossed the Fenêtre de Saleinaz; since Llewelyn Davies —happily with us tonight—(Hear, hear) made his famous ascent of the Dom or joined with his old friend Vaughan Hawkins in an expedition on the west side of Mont Blanc and the Col de Miage. The members have gone farther and higher since then. They have found the right way up peaks in the Andes, in the Himalaya, in the Caucasus, in the Rockies; while in the English Lake District and Scotland they have found the wrong way up nearly every conceivable ascent. (Laughter). The club has expanded, developed and increased its membership. But, notwithstanding all this, the essential old bond of union—the love of the mountains—remains as it always has been, and the club has been constantly true to its traditions on the lines which you, the founders, laid down, and which you, the early members, so successfully developed. (Hear, hear). It has been said often that it is with a feeling of regret that one finds one's mountaineering is coming to an end. I cannot quite myself take that view, for it is not till towards the time when we are approaching

the end of our more active career that we realize to the full all that the mountains have done for us—(hear, hear)—and indeed, the consciousness may come quite suddenly upon us that we have perhaps, after we have climbed our very last mountain, gained a great possession of valued friendships and of happy memories—(hear, hear)—memories of which the recollection can fade away only with life itself. In the first volume of 'Peaks, Passes and Glaciers' John Ball wrote: 'The community of taste and feeling amongst those who in the life of the High Alps have shared the same enjoyments, the same labors and the same dangers constitutes a bond of sympathy stronger than many of those by which men are drawn into association.' Is not this true? Could any prediction have been more amply verified? Of a truth we were brought up not only in the law but amongst the prophets. You, the founders, revealed a new and wholesome pleasure which the early members so successfully deveolped. You discovered and made known the most unselfish and the grandest sport in this world. But in founding the Alpine Club you did a great deal more than that. You were the means of linking together, fascinated by one common pursuit, men of every taste, pursuit and occupation in life; and much more, and more important, men of every age—the young, those more mature in years, and those who have arrived at the period which the young are pleased to consider old, but which as a matter of fact is nothing of the kind. (Laughter and applause). This you, the founders, and you, the early members, have done for us, and for it we the rest shall ever be grateful to you.

"It is impossible, as I look round these tables, not to miss many faces once familiar and constantly seen at our Winter Dinners. It is hard indeed to believe that we must search in vain for Leslie Stephen or for the keen, alert face of Charles Mathews. Let that pass. I

would not on the present occasion touch, however faintly, a note of sadness. Let us be content with McCormick's happy suggestion that our old friends are with us in spirit this evening. Gaps there may be, but our ranks are still close. Among our founders—those who have written after their names those mystic letters 'O.M.,' signifying alternatively 'Original Member,' or to us the rare 'Order of Merit'—(hear, hear)—those who are still with us are both present to-night in the persons of Walters and Wills."

In the following remarks Mr. Douglas Freshfield struck a keynote: "And now they, and we, are called on to a more arduous task—to preserve our conquest. The Alps are threatened with invasion by a horde of Goths and Vandals: the company-promoter, the syndicate and the speculator. Men who know not Nature, and whose God is Mammon, are in the field. They make pretence to be philanthropists. They would have us believe that they desire to benefit the peasantry and the economic tourist. It is a false pretence. What does the peasant, the guide, the driver, or the local innkeeper gain by the crowd, done by contract, that is whirled past his door? What does the tourist gain that is carted, tightly packed in a covered van, through scenery he could better see in a cinematoscope? I met the other day in Switzerland a specimen of the modern tourist. 'Sir,' said he, 'I wish to sample the glasher region. Can you tell me if I can do it from Berne in a day without sleeping out?' He did it, and found it 'less extensive than he had anticipated.'

"It is for this class of travellers that the modern engineer is set to work. For them he has veiled the Staubbach in sooty reek; for them he has turned the flowery turf of the Wengern Alp into a Happy Hampstead; for them he is ready to plant a moving platform in the sublime solitudes of the Aletsch Glacier; for them he proposes to furnish the Matterhorn with a

lift, and to convert the summit into a grotto furnished with a restaurant, a consulting-room for sufferers from the rarity of the air, and a stall for the sale of picture postcards."

The foreging extracts serve to illustrate the high estate to which a national institution such as the Alpine Club of England may arrive within a period of fifty years, and the valuable national asset it may become as a bond of sympathy and good feeling between men in various paths of life, as well as an exponent of all that is best in literature, science and art.

The text of the speeches in full is a brief history of the Club, most charmingly told, and our members are advised to obtain copies of the February number of the Alpine Journal, Vol. XXIV., No. 179 (Address Edward Stanford, 12, 13 and 14 Long Acre, London, W.C. Price two shillings). The same number contains an account of the accident on the Schwarzhorn written by Mr. G. L. Stewart, who, as well as the writer, was with the climbing party when the deplorable accident occurred. An account of this accident appeared also in the May number of "Rod and Gun," in the account given of the President's visit to England to attend the Alpine Club's Jubilee.

IN MEMORIAM.

Colonel A. Laussedat.

It is with deep sorrow we have to record the death of one of our Honorary Members, Colonel Aimé Laussedat, a scientist of world-wide reputation and a man of most lovable personality. Dr. E. Deville has kindly prepared the following biographical note for the Journal:

"In March of last year, the members of the Alpine Club of Canada were grieved to learn of the death of Col. Aimé Laussedat, a distinguished Honorary member of the Club, after a short illness of only six days. Although eighty-nine years old, he had, during the preceding summer, made what he called a pleasure trip to Italy, but which actually was a visit to the scientific establishments and an investigation of their work. The fatigue of the trip proved too much for him, and shortly after his return he became seriously ill. A good long rest at his country place restored his health. Feeling quite strong, he came back to his Paris residence to take part in a vote at the Academy of Sciences; he had also arranged to give, on March 24th, a lecture in which particular mention was to be made of Canada and of the honor conferred upon him by giving his name to one of the Rocky Mountain peaks. Alas! Six days before the date of the lecture the recent illness had returned and carried him away.

"Born in 1819, Laussedat was admitted to the Ecole Polytechnique in 1838, graduating in 1840 as an officer of Engineers. As Captain of Engineers he was detailed in 1846-48 to survey the Pyrennées Mountains in connection with the Franco-Spanish boundary. It was while making this survey that he conceived the idea of

the application of perspective to surveying, his perspectives being drawn by means of a camera lucida of his own invention. After the discovery of Photography, the method developed into photographic surveying, or, as it is now called, Photogrammetry.

" From 1856 to 1870 he was Professor of Astronomy and Geodesy at the Ecole Polytechnique; Commissioner for the Franco-German boundary in 1871-73; Director of Studies at the Ecole Polytechnique in 1879-81, and from 1881 to 1900 Director of the Conservatoire des Arts et Métiers, the French counterpart of the South Kensington Museum. He was Grand Cross of the Legion of Honour, Colonel of Engineers and a member of the Academy of Sciences. The list of scientific societies, French and Foreign, who considered it an honor to enroll him as a member and were proud to have him as president or vice-president, is too long to be reproduced here.

"He was best known as the father of Photogrammetry. He was first to lay out the principles of the art and to indicate its applications. His papers, published in 1854, 1859 and 1864, contain a full treatment of the subject and little has been added to his methods since their publication. It was in Canada that Photogrammetry received its first practical and extensive application. Laussedat lived long enough to see it adopted in many countries, but Canada had always a warm place in his heart. The trees and plants of the Canadian Rockies, which he owed to a delicate attention of our President, were shown with pride to every visitor to his park, and were the object of special care.

" He was a most distinguished scientist and an indefatigable worker. He has contributed innumerable articles to scientific papers and periodicals. He was a favorite lecturer and the author of a large number of books. One of his last works, " Researches on Topographic Instruments, Methods and Drawing," a masterly

treatise of 950 pages, large octavo, was written and published after he was eighty years old. Up to his last day he maintained an active correspondence with his numerous friends and admirers in France, as well as abroad.

"Few men in France have been so much in the public eye as Laussedat. He counted among his friends almost every Frenchman who had become prominent either as a scientist, a literateur, an artist or otherwise. An optimist and an enthusiast, he was one of those few fortunate beings who can see only the bright side of human nature; to hear him, his friends were perfection, and all that he knew of them was to their advantage.

"A staunch Republican, like most of the graduates of the Ecole Polytechnique, he was so shocked by the *coup d'etat* when Napoleon III. forcibly dissolved parliament and seized the throne, that he tendered his resignation to his friend, Marshal Vaillant, one of the new emperor's minister. Vaillant knew Laussedat and appreciated his immense talent: he dissuaded him from this rash step.

"In September, 1852, he married a Miss Bruel. The coming clash between Austria and the allied armies of France and Italy was already foreseen. Of a practical turn of mind, Laussedat thought that this was a capital opportunity of combining business and pleasure by selecting for the wedding trip the probable scene of the struggle, the Austrian province of Venetia. It so happened that in their rambles the couple came to the neighborhood of fortifications; the unfeeling Austrian police pretended that their behaviour was suspicious and rudely interrupted the honeymoon by clapping them in jail. How, before being searched, Laussedat managed to get rid of his surveying instruments and how he demonstrated that he and his wife were just innocent tourists, is another story. They were eventually released, but not without a gentle hint to clear out before the authorities had time to change their mind. The

result of this early experience for Mrs. Laussedat was a deep-rooted conviction that her husband's zeal and impulsive temperament might at times carry him too far and henceforth she always took care to counsel prudence and circumspection.

" But there is no watchfulness so constant that it will never relax and it might do so, for instance, just as a balloon ascension was preparing for the elucidation of some obscure point of meterology. Who could resist such a temptation? Surely not Laussedat, and could any one be blamed if, after a rough landing, he had to be placed in the doctor's hands?

" The lovable nature of the man was best appreciated in the intimacy of his home. Those who have had the good fortune to enjoy the hospitality of his beautiful country place, " The Priory," remember him as a delightful conversationalist. Having known personally all the prominent men of his time and been an actor in most of the great events of French contemporary history, he had an inexhaustible fund to draw upon. To listen to him telling his reminiscences of men and things and explaining what had taken place behind the scenes, was a treat never to be forgotten.

E. D."

ALPINE NOTES.

Expedition to Mt. Robson.

In the Report of the Geological Survey of Canada for 1899 (Part D, Vol. XI), appears the following note by James McEvoy, B.A. Ss., who was in charge of an expedition to examine the geology and natural resources of the country traversed by the Yellow-Head Pass route from Edmonton to Tête Jaune Cache:—

"Looking up Grand Fork is the most imposing view met with on the whole route. Great mountains are on every hand, but over all stands Robson Peak, 'a giant among giants and immeasurably supreme.' This, as well as the following, is from the description of the mountain by Milton and Cheadle.* 'When we first caught sight of it, a shroud of mist partially enveloped the summit, but this presently rolled away, and we saw its upper portion dimmed by a necklace of feathery clouds, beyond which its pointed apex of ice, glittering in the morning sun, shot up into the blue heaven above.' The top of the mountain is usually completely hidden and rarely indeed is it seen entirely free from clouds. The actual height of the peak is 13,700 feet, or 10,750 feet above the valley. The face of the mountain is strongly marked by horizontal lines, due to the unequal weathering of the rocks, and has the appearance of a perpendicular wall. From the summit to the base on the Grand Fork, a height of over 10,500 feet, the slope is over 60° to the horizontal.

"Although Robson Peak has been long known, its height had never been determined, nor was it supposed to be particularly notable in that respect, but now since the height of Mts. Brown, Hooker and Murchison have

*The North-West Passage by Land, pp. 252-253.

Mary T. S. Schaffer, Photo

PROF. A. P. COLEMAN AND PARTY ON WILCOX PASS

James McEvoy, Photo *Geological Survey of Canada*

MT. ROBSON, GRAND FORK, FRASER RIVER

been proved to be greatly exaggerated, it has the distinction of being the highest known peak in the Canadian Rockies.

"It is interesting to note that in a paper read before the Royal Society of Canada by Dr. G. M. Dawson, the following paragraph occurs: 'The Kamloops Indians affirm that the very highest mountain they know is on the north side of the valley at Tête Jaune Cache, about ten miles from the valley. This is named *Yuh-hai-kas-kun,* from the appearance of a spiral road running up it.' The mountain referred to is undoubtedly Robson Peak, as it is only fifteen miles north from the valley at Tête Jaune Cache. The 'spiral road' is probably an Indian's imperfect description of the horizontal lines on the face of the mountain. As far as can be learned no one, either Indian or white, has ever succeeded in reaching the summit."

The accompanying ilustration has kindly been loaned to the Journal by the Director of the Geological Survey.

Early last August an expedition consisting of Prof. A. P. Coleman of Toronto University, Mr. L. O. Coleman and the Rev. Geo. B. Kinney, all active members of the Club, started from Laggan, a station on the Canadian Pacific Railway, with the intention of making the first ascent of this virgin peak, estimated to be 180 miles distant from the starting point.

The party followed the Pipestone and Siffeur Rivers to the Saskatchewan; then along the south bank of that stream, fording its tributaries, Mistaya River and Little Fork River. Finally the Saskatchewan itself was forded, and followed northward beneath the towering mass of Mt. Wilson. It was again crossed above the West Branch, and the party was soon climbing the side of Mt. Saskatchewan, past the canyons and waterfalls at the head of the stream, to the watershed between the Saskatchewan and Sun Wapta Rivers; above which towered the snow and ice-clad heights of Mt. Athabaska. The

watershed is locally known as Wilcox Pass. Before reaching this spot much rainy and bad weather had been encountered and it now climaxed in a wild snow-storm.

Descending from the Wilcox Pass by the valley of the Sun Wapta, over widespread shingle and mud flats and by trails badly obstructed by dead-fall or almost obscured by the growth of the young jack-pine, the main stream of the Athabaska was reached. This stream was followed to the junction of Miette River, the party being considerably delayed by brulé and second growth.

After a vain search for a ferry, which it was reported would be found near the mouth of the Miette, the Athabaska was crossed by rafting. Now ascending the Miette to its source in Yellow-Head Lake, the pass was traversed and the headwaters of the Fraser River followed to Moose Lake. Continuing down the Fraser, at the junction of the Grand Fork the party obtained the first view of the "imperial mountain of our aspiration: one vast, lone, snow-clad, cloud-capped peak, wrapped in the solitude of centuries."

A day was spent seeking a short route from the Fraser to a tree-line camp on the flanks of the mountain. In the end, however, a path had to be cut, by dint of much chopping, up the Grand Fork, with traces of an old-time trail for guidance; but so sinuous and rough that it was with great difficulty pack-ponies could be taken over it to a camp beside the rushing torrent at the base of the mountain.

Two more days were spent searching for a route of ascent; and when, at length, the party had with great difficulty established a camp at timber-line, snow covered the ground and was still falling. Next morning it was so deep that the impossibility of an ascent within the limit of the time at its disposal was recognized and the party was compelled to admit defeat. It was doubtful if the heavy snow-fall would permit of an attempt being made, even if it had been possible to wait for an oppor-

tunity. "Perhaps the spirit that dwells in this towering fortress, alone and undisturbed, defies molestation and works with Fate against him who aspires to knock at its ancient door."

The Journal is indebted to Mr. L. O. Coleman for the above notes, and sympathizes most sincerely with the failure of the plucky attempt to reach the summit of Mt. Robson, which involved an immense amount of hard work and much privation, as well as a considerable outlay. Should the party again attempt this achievement, as it is understood is intended, it is hoped the past experience will prove of value and lead its next expedition to a successful issue.

(Editor)

Mount Douglas.

First Ascent of North Tower. Attempt to Ascend South Tower.

A party consisting of L. M. Earle of the English Alpine Club and two ladies, accompanied by the Swiss guides Edouard Feuz Sr., and Gottfried Feuz, started from Lake Louise Chalet late in August or early in September of last year with the intention of making an attempt to ascend the still unconquered South Tower of Mt. Douglas.

The following notes are from a description of the expedition supplied by Mr. Earle:—

The party reached the headwaters of the Red Deer River by way of the Pipestone and Little Pipestone Valleys and camped on the third day at the head of a small valley leading southeast from the main valley and immediately under the North Tower of Mount Douglas on the west side. The peak now rose between the camp and the bed of the long lake directly below it on the east side, here referred to as "Lake Valley."

The North Tower was first ascended, and, though no great difficulty was experienced, much care was required owing to the looseness of the rock. The route selected was not the easiest one and led to some rather awkward scrambling on the first buttress: time 5½ hours from camp to summit; barometer altitude 10,900 feet. The altitude of the North Tower, according to the Topographical Survey, is 11,015 feet. The summit commands an exceedingly fine view. There was no indication of a previous ascent.

An attempt was next made to ascend the South Tower. After viewing the contour of the South Peak through strong glasses, both from the North Peak and

A. O. Wheeler, Photo NORTH TOWER SOUTH TOWER

MT. DOUGLAS, AT HEAD OF RED DEER RIVER

from the *névé* basin to the southeast, the general opinion was that it seemed almost certain that the mountain descends in sheer precipices to Lake Valley.

From Mount Douglas there runs a rocky ridge in a southwesterly direction, containing two well-marked gaps. From the first of these, which is well under the mass of the South Tower, the attempt was made. The gap was reached in 3½ hours from the camp; first over the glacier flowing northwest from the base of the peak, the last slope being very steep and covered with treacherous snow, and then across a little rocky bay.

From the gap a rather repellant looking chimney leads upward. It was tried in turn but without success, and was not conquered until Edouard Feuz stood upon his nephew's shoulders and he on Mr. Earle's. Another short but difficult crack led to a good platfrom, which, by the aid of sundry ropes, was attained by all. Here a neck of easy rock connected with the base of some steep slabs. The party crawled up these for a short distance with but few handholds and no anchorage; and then came the *impassé:* the only possible way up was by a short but slightly overhanging chimney.

Had the rock been firm, or had there been any possibility of giving the leader a shoulder up, the difficulty would have been overcome; but every hold broke away as it was tried and the nature of the place precluded any possibility of assisting the leader.

Greatly disappointed, the party was compelled to retreat and descended to the gap, leaving eighty feet of Buckingham's best rope hanging from the chimney for the benefit of the next party.

According to the measurements of the Topographical Survey the height of the South Tower is 11,220 feet.

(Editor)

OFFICIAL SECTION.

REPORT OF SECRETARY.

The Alpine Club of Canada passed its second birthday on March 28th. The original membership of 79 has increased to 400, of whom eight are honorary, and eleven are associate members. The new honorary members are the Rt. Hon James Bryce, His British Majesty's Ambassador at Washington, and the Rev. James Outram, author of "In the Heart of the Canadian Rockies." One new associate member was added, Mr. Schiller Flindt. The only loss by death came to the honorary list in the decease of Col. Laussedat, the eminent and venerable French scientist.

The constituency of the Club has extended to the Orient and Antipodes: India, Australia, South Africa, Holland and Switzerland and a dozen of the United States are represented in its membership, as well as Britain and all Canada.

The second annual meet was held during the first week in July in Paradise Valley with 150 members and guests in attendance. Owing to the heavy snowfalls of the previous winter and an unusually late spring, the meadow at the head of the valley was too wet for an encampment, and it was necessary to hew out a place in the unbroken forest at the base of Mt. Aberdeen. This involved very considerable though speedy labour: but the trees were felled, the ground prepared, the tents erected and everything made comfortable by the opening day. In spite of bad weather—snow and rain and thunder—climbing began on the day appointed, and there was not one beginner who failed to accomplish one of the official climbs, Mts. Temple and Aberdeen. The total number qualifying for active membership was 66; also a large number of active members climbed these or other peaks every day. The President and his staff of mountaineers considered that the character of the climbing was greatly in advance of that done the previous year. The round ascents were made in less time; physical hardiness was more in evidence; and the camp-fire, that supreme test of good-fellowship, if not of mountaineering-stuff, witnessed no dampened buoyancy in those of the company who had spent the day on glacier and neve and rock. This was the general rule. The excursions, too, over the difficult snow-passes, notably Abbot Pass, were much more strenuous than the excursions from Yoho Pass, and, on the whole, the achievements of Paradise Valley Camp showed marked progress in amateur mountaineering.

The photographic exhibition, at which sixty pictures were shown by nine exhibitors, was an interesting feature of the meet. The prizes of a gentleman's and a lady's ice-axes were awarded to the President and to Mr. Bridgland, but all the exhibits reached a high standard of excellence.

The annual meeting was held around the camp-fire on the evening of July 9th. The chief busines of the meeting was a resolve to build in the near future a Club House at Banff, where the Club's headquarters ought to be. Some fifty members promised to contribute $10.00 each to the scheme. A suitable site of three and a half acres on the side of Sulphur Mountain has been generously leased us by the Dominion government; and we expect soon to have there a building worthy of the Club, which shall give us a new visibility and a home to our growing library. Such a Club House will be a headquarters at which to rally our members for alpine work in the mountains, and from which to organize camps at advantageous points; so that members may make up parties and go from one to the other at times suitable to them, finding good accommodation at each. The President at the last annual meeting threw out a suggestion which is likely to take tangible shape at no remote day, namely: that a series of camps in different climbing-centres be established each summer, for the better convenience of the whole Club, which is growing too large for a single annual session of only one week's climbing. This is a matter of development, and is dependent upon the erection of a Club House.

A happy and hearty transaction of the meeting was the standing vote, bestowing honorary membership upon the Rt. Hon. James Bryce, a past President of the English Alpine Club, a veteran mountaineer, who has been honored by having one of the loftiest mountains in the Rockies named after him.

Resolutions of thanks were cordially passed to the Canadian Pacific Railway Company, the Alberta Government and the Federal Government for generous assistance to the Camp, without which it had not been possible to provide so excellent a school of mountaineering. There is no doubt about the interest which such gifts yield in something more than money to the nation. I quote Milton's words applied by Tyndall to mountaineering: "Such exercises constitute a good means of making them healthy, nimble, and well in breath, and of inspiring them with a gallant and fearless courage, which being tempered with seasonable precepts of true fortitude and patience, shall turn into a native and heroic valour, and make them hate the cowardice of wrongdoing."

A kindly feature of the meeting which was adjourned to the following evening, were two resolutions of appreciation presented to the Secretary and Mrs. Wheeler, the wife of the President, who in addition was presented with the perpetual freedom of Camp and Club House. These resolutions were afterwards beautifully illuminated on vellum, Mrs. Wheeler's being placed in a silver casket accompanied by a silver key. The President also, received a gold watch-chain and compass in token of the Club's appreciation of his arduous toil in the interest of organized mountaineering in Canada.

After the Camp in Paradise Valley had dispersed, the President received an invitation from the Alpine Club of England to be its guest for three days at its Jubilee on the 16th, 17th and 18th of December, 1907, and though greatly pressed for time, Mr. Wheeler was able to accept the invitation and make a hasty visit to the Club in London, where he was received with warm

hospitality, and in spite of the limitations of time, managed to get a day or two in Switzerland to see with Canadian eyes the Swiss Alps. Cordial relations with British mountaineers have been established through this visit, the first fruits of which will appear when the British Association meets in Canada next year. A party of Alpinists are already arranging to climb in the Rockies under the auspices of the Alpine Club of Canada, before or after the great meetings to be held in Winnipeg.

Upon his return to Canada the President received the distinction of honorary membership from this Club, mother of organized mountaineering and first of the one hundred and sixty-eight alpine clubs in the world. By this courtesy, Mr. Wheeler is adopted into a distinguished alpine fraternity comprising men eminent in science, letters, law, the Church, and every intellectual realm in Britain. The honor is also to the Club over which he so devotedly presides, and is the more marked that it is the first of the kind that has been bestowed upon a representative from any of the British dominions beyond the seas.

Local meetings of the Club have been held as follows: one in Calgary and two in Winnipeg where also two meetings of the Executive Committee were held. At all of these the President was present. Taking advantage of Mr. Wheeler's visit to London, the Executive appropriated $50.00 of the Club's funds to the purchase of rare volumes, now out of print, dealing with the early history of the Canadian Mountains. The recent changes in the Constitution were considered, each change having its birth not in the Executive, but in the Club itself, and taking shape in the form of an amendment by suggestion from members. These have been voted upon and are now Club law. Amendments two and three are too obviously necessary in this so large and democratic organization, for any comment; number one requires explanation. When a glacier region was discovered in the Cascade Range on the Pacific Coast, where climbing began almost at sea-level, it was evident that the ascent of a glacier-hung peak, whose altitude was below the 10,000 limit, was ample justification for active membership. It will be seen at a glance that the new clause impartially meets the requirements, and is thus an improvement in the Constitution.

The report would be incomplete without reference to the Club's modest social functions, functions necessarily local by reason of its widely scattered constituency. On the President's return from England he was the guest of the Winnipeg members at a delightful little dinner at the Tea Kettle Inn, when some thirty guests were present. The occasion was made the opportunity for an address, giving an account of his visit to attend the Jubile Celebration and subsequent trip to Switzerland. A day later he lectured on the Canadian Mountains as a recreation ground at the Collegiate Institute of Portage la Prairie. The lecture was very well attended and half of the net proceeds were turned in to the Club House Fund. Several small reunions were held during the year by the Winnipeg members.

Calgary was not behind in matters of social amenities. Last February the second of the Annual Alpine Club Dinners was held at Horchover's Restaurant, sixty-five members and guests being present. On this occasion, also, an account was given of

P. D. McTavish, Photo

THE MORNING HORN AT CAMP

C. W. Thompson Photo

DELIGHTS OF THE "GLISSADE"

the Alpine Club's Jubilee Celebration. In April the President lectured to the A.Y.P.A. on the "Wonderland of Canada." The house was crowded to the doors and many turned away. The result has been an addition to membership of a number of fine, athletic young men who give promise of "doing things" in the near future.

The Journal has met with a cordial reception. Orders for copies of Volume I are still received from various places in Canada and the United States. We are not unaware that it might be better, and we are not without hope that soon it will rank with any alpine journal in the world. The second volume will be placed in your hands at the Camp, and we may be pardoned if we congratulate ourselves on the excellence of its scientific articles. We would be grateful for any suggestion concerning the best means of discovering the literary talent undoubtedly existing among the members of the Club.

The Alpine Club of Canada: it is a good name and a significant, one to quicken patriotism and to inspire a desire for experience in the hardships and delights of climbing mountains. There is much, very much, in a name, and the soul of Shakespeare would agree. We do not suppose that this Club will be the only one ever in Canada. No doubt in the next hundred or two hundred years, a great many mountaineering clubs will flourish in numerical strength and in esprit de corps: for mountaineering is going to be more and more a Canadian sport, and when Canada is as populous as the motherland, the Rockies of Canada will be as popular as the Swiss Alps. But the Alpine Club of Canada will still be the national mountaineering club, and will have gathered to itself a noble succession of Canada's good men in every high and useful vocation of life; will have added a worthy somewhat to Canadian literature, art and science.

Respectfully submitted,

Elizabeth Parker, Secretary.

STATEMENT OF TREASURER.

From 1st July, 1907, to 22nd May, 1908.

Receipts.

Balance on Hand 1st July, 1907	$ 304.08
Associate Members' fees	150.00
Active Members' fees	655.00
Graduating Members' fees	122.50
Subscribing Members' fees	6.00
Life Members' fees	50.00
Proceeds from Camp in Paradise Valley, 1907	163.35
Bank interest	7.27
Total	$1458.20

Disbursements.

Printing, Stationery, etc.	$ 139.01
Typewriting assistance	87.50
Books for Library	59.08
Postage, Express and Exchange	58.12
Grant to President on account of his expenses to Alpine Club Jubilee in London	200.00
Printing and distributing of Journal for 1907 over sales and previous payment	346.27
Printing and distributing Alpine Herald	25.94
Total	$ 916.02
Balance on hand	$ 542.18
	$1458.20

Winnipeg, 23rd May, 1908.

D. H. Laird, Treasurer.

REPORT OF LIBRARIAN.

There are now forty-two books and fifteen minor publications in the Library, besides seven volumes (1894-1907) of the Alpine Journal, the official organ issued quarterly by the English Alpine Club. This shows an increase over last year of thirty-two volumes. Of the whole forty-two, twenty-five were acquired by gift.

Exchanges have been made with: The English Alpine Club, the Scottish Mountaineering Club, the American Alpine Club, the Appalachian Club, the Sierra Club, the Mazama Club and the Smithsonian Institution. The English Alpine Club, also, presented the Library with the seven volumes of "The Alpine Journal" mentioned, and the Sierra Club of San Francisco with Vol. V and Nos. 1, 2 and 3 of Vol. VI. A complete set of the former publication may be had through a second-hand book seller in London for one hundred and twenty-seven dollars ($127.00). The price will increase as the Journal becomes more difficult to obtain every year. The matter of securing it for our Library will come before the Club at the Annual Meeting.

At a meeting of the Executive Committee the sum of fifty dollars ($50.00) was voted for the purchase of some rare books, dealing with the early history of the Rocky Mountains, and Mr. Wheeler was able to secure fourteen volumes while in London attending the Alpine Jubilee. The most important of those purchased were: Sir Alexander Mackenzie's very rare Journal; Sir George Simpson's "A Trip Round the World," and Ross Cox's valuable book. We have a dealer on the lookout for a complete copy of Palliser's Journal.

Too much stress cannot be laid on the importance of the Club library; and no reasonable opportunity should be lost, whereby we can obtain works of value dealing with mountains and mountaineering, on historical, scientific or aesthetic lines. We hope that the members will be loyal and help to extend the book-shelves. Soon, we also hope, it will have permanent shelter in the Club House.

CATALOGUE.	PRESENTED BY
The Selkirk Range, Vol. I and II..... ....A. O. Wheeler..	Mr. Wheeler
Dent's Mountaineering.....Dent..	Mr. Mitchell
The House of Sport..... Composite Authorship..	" "
From Old to New Westminster..... ....Sir Sandford Fleming..	Sir S. Fleming
Climbing in the Himalayas..... ....J. Norman Collie..	Dr. Collie
Climbs and Explorations in the Canadian Rockies.....Collie and Stutfield..	" "

CATALOGUE.	PRESENTED BY
Ascent of Mt. St. Elias..Filippo de Filippi..	Mr. Tom Wilson
Voyages et Aventures dans l'Alaska.....Frederick Whymper..	" " "
The Land of the Cliff Dwellers.....Frederick Chapin..	" " "
Mountaineering in Colorado.....Frederick Chapin..	" " "
Chamonix and Mt. Blanc.....Edward Whymper..	Mr. Edward Whymper
A Guide to Zermatt and the Matterhorn..Edward Whymper..	" " "
Camp-fires in the Canadian Rockies.....Hornaday and Phillips..	Mrs. Parker
Glaciers of the Alps.....Tyndall..	" "
The Playground of Europe.....Sir Leslie Stephen..	" "
The Alps from End to End.....Sir Martin Conway..	" "
Glaciers of the Canadian Rockies and Selkirks.....W. H. Sherzer..	Dr. Sherzer
Mountain Wild Flowers of Canada.....Julia W. Henshaw..	Mrs. Henshaw
Alpine Flora of the Canadian Rocky Mountains....Stewardson-Brown and Schaffer..	Mrs. Schaffer
Among the Selkirk Glaciers.....W. Spottswood Green..	Mr. Meinecke
California and Alaska and Over the Canadian Pacific Railway.....William Seward Webb..	Mr. Robson
Siberia.....Samuel Turner..	Mr. Turner
Appalachia, Vol. vii, ix and x.....	Appalachian Club
A Trip Round the World, I and II.....Sir George Simpson..	By purchase
Wanderings of an Artist.....Paul Kane..	" "
Mission de l'Oregon .....De Smet..	" "
Saskatchewan and the Rocky Mountains, 1875 .....Southesk..	" "
Astoria, 1836.....Washington Irving..	" "
The Northwest Passage by Land, 1863..Milton and Cheadle..	" "
Ocean to Ocean, 1872.....Geo. M. Grant..	" "
Impressions of a Tenderfoot, 1890.....St. Maur..	" "
The Columbia River, Vol. I and II, 1832..Ross Cox..	" "
The Solitary Hunter, 1859.....Palliser..	" "

CATALOGUE.	PRESENTED BY	
Camps in the Rockies, 1883..... ....Baillie-Grohman..	"	"
Mountain and Prairie, 1880..... ....Daniel M. Gordon..	"	"
The Great Lone Land.....Butler..	"	"
A Voyage Through North America, 1801.. ....Alexander Mackenzie..	"	"

PUBLICATIONS.

Alpina Americana.

Sierra Bulletin, Vol. V and Nos. 1, 2 and 3, Vol. VI.

Alpine Journal, Vols. XVII to XXIV.

The Mountaineers.

Scottish Mountaineering Club Journal.

Modern Glaciers.....Wm. S. Vaux..

The Great Glaciers of the Illicillewaet..
....Geo. and Wm. S. Vaux..

Glacial Studies in the Canadian Rockies and Selkirks.....W. H. Sherzer..

Rod and Gun in Canada, April 1906 to date.

Respectfully submitted,

Jean Parker, Librarian.

April 26th, 1908.

REPORT OF 1907 CAMP.

Paradise Valley is situated about six miles easterly, by road and trail, from Laggan Station on the Canadian Pacific Railway, and about three miles from Lake Louise. A characteristic glacier-fed stream dominates the valley for the greater part of its length—some six miles. The source is in the Horseshoe Glacier, a glacier of the piedmont type, surrounded by the towering precipices of Mts. Lefroy, Hungabee, Temple, Eiffel and Pinnacle; from whose hanging glaciers the supply is received.

The valley was so named in 1894 by S. E. S. Allen, D. W. Wilcox and party, who climbed to the summit of the Mitre Pass from the Lake Louise side upon a day that was gloomy and depressing in the extreme. As they reached the summit the sun broke through the clouds and flooded the valley on the eastern side of the pass with light, bringing out so charmingly the varied contrasts in color, of forest and alp-land, veined by glittering silver streams, of rock and snow, that it was promptly named "Wastach" or "Paradise" Valley.

It was on the borders of these alp-lands, where the bright green larches grow sparsely in a park-like fashion, and pink and white heather carpets the ground, that it was originally intended to place the Club Camp for 1907. Unfortunately the heavy snowfall of the previous winter and the late spring had left this part of the valley still covered at the time when it became necessary to select a camp ground. An expedition for the purpose was made on the 22nd of June, when the President was accompanied by J. P. Forde and C. W. Rowley. It was now too late to change the locality, so a site was selected lower down the valley, immediately below the slopes of Mt. Aberdeen, and a camp-ground literally carved from the virgin forest, which luckily at this altitude, 6,300 feet above sea level, is not very dense.

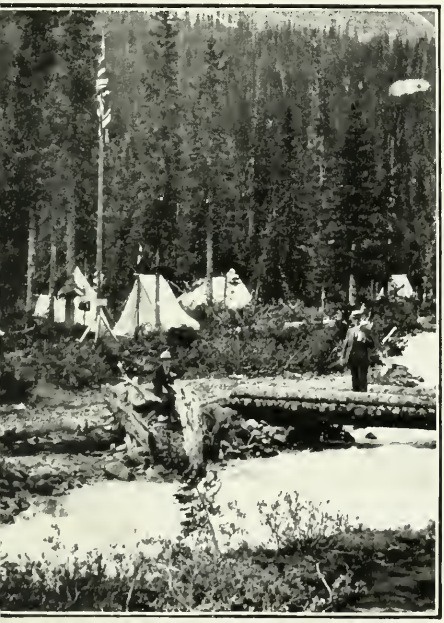
Valuable assistance in making the camp-ground was rendered by a trail-gang of the Canadian Pacific Railway Company, sent in by the Resident Engineer, Mr. J. P. Forde, to improve the pony trail up the valley and construct bridges where it crossed the stream. Owing to limitations of space, the camp was divided into two parts: the Main Camp, Official and Ladies' Quarters being on the west side and the Gentlemen's Quarters on the east side of the stream. Official Square was arranged in symmetrical order, as at the Yoho Camp, but the sleeping tents were scattered promiscuously through the woods, and paths leading to them cut through the underbrush.

Everything was in readiness on the opening day, July 4th, and although the morning opened with sleet and rain, from then on the weather was perfect throughout the entire week, and left nothing to be desired in that respect.

In all one hundred and fifty-seven persons attended the Camp, inclusive of the staff of assistants.

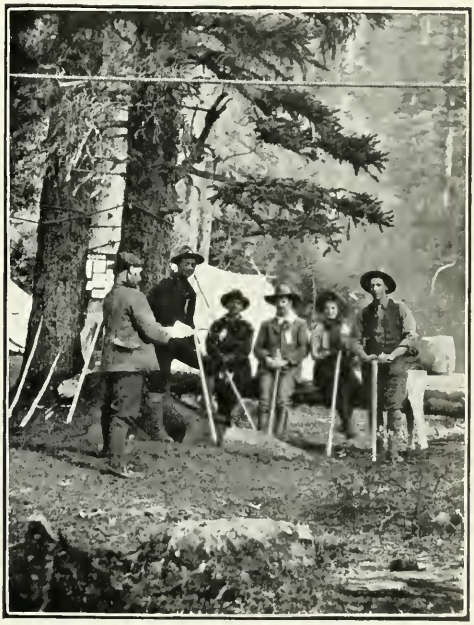
P. D. McTavish, Photo

MANY FEET ABOVE PARADISE VALLEY



E. S. Barnes, Photo

GENTLEMEN'S QUARTERS



E. S. Barnes, Photo

ROLL CALL FOR O'HARA

In Canada the following places were represented: BRITISH COLUMBIA, Field, Golden, Kelowna, Revelstoke, Vancouver, Victoria. ALBERTA, Banff, Calgary, High River, Laggan, Lethbridge, Morley, Olds, Stettler. MANITOBA, Portage la Prairie, Winnipeg, Virden. NEW BRUNSWICK, St. John. ONTARIO, Carleton Place, Kingston, London, Ottawa, Toronto. QUEBEC, Montreal. SASKATCHEWAN, Indian Head, Regina.

From the United States of America: CALIFORNIA, Berkeley, Oakland. ILLINOIS, Galesburg, Lake Forest. INDIANA, Fairmount. MASSACHUSETTS, Boston. NEW YORK, New York. NORTH DAKOTA, Bismark. SOUTH DAKOTA, Sioux Falls. OREGON, Portland.

From Over Seas: AUSTRALIA, Melbourne. ENGLAND, Bristol. SWITZERLAND, Interlaken.

For the great success of the Camp we are indebted, in a considerable measure, to the Dominion Government, the Provincial Government of Alberta, and the Canadian Pacific Railway Company, all of whom, both on this occasion and on the previous one at the Yoho Camp, have given the Club every possible assistance in the endeavour to make known to Canadians the attractions of the Rockies as a field for mountaineering and recreation, and to place the same within easy reach, realizing the great benefit that will accrue from this noble and enthralling sport.

To the Canadian Pacific Railway, moreover, we are grateful; for, by providing a special rate over its lines to the summer Camp, it has conferred a great boon upon many who otherwise could not possibly avail themselves of the opportunities created by the Club. At the same time these Camp visitors are the means of bringing many to the mountain regions, who, through the amounts they spend, provide a revenue for those employed in catering to tourists.

REPORT OF CHIEF MOUNTAINEER.

The mountaineering was again in charge of M. P. Bridgland, assisted by H. G. Wheeler and E. O. Wheeler. The two Swiss guides, Edouard Feuz and Gottfried Feuz, of Interlaken, who were at the Yoho Camp, were placed at the disposal of the Club by the courtesy of Mr. Hayter Reed, Manager-in-Chief of C.P.R. hotels for the week of the meet. Peter Kaufmann, of Grindelwald, a new Swiss guide in the Canadian Rockies, was also used during the first few days of the Camp, having been sent there to get some knowledge of the mountains in the vicinity of Lake Louise. Later, he was attached to the party of B. S. Comstock, by whom he had been retained.

Gentlemen who were placed in responsible positions as guides to various ascents and expeditions were: Rev. J. C. Herdman, Rev. Geo. B. Kinney, P. D. McTavish and D. N. McTavish.

Mts. Temple (11,626 ft.) and Aberdeen (10,340 ft.) were the official climbs by which Graduating members qualified for Active membership. Sixty-six graduated, as follows:

ON MOUNT ABERDEEN.

June 23rd.
Rowley, C. W.

July 4th.
Ladler, J. W.

July 5th.
Armstrong, T. B.
Bleasdale, H.
Hart, A. R.
Hart, F. W.
McKillican, W. C
Miller, H. H.
Reid, J. A.
Wilson, L. C.

July 6th.
Bell, F. C.
Bell, Miss N.
Bennett, W. J.
Burch, R. E.
Campbell, Mrs. P. M.
Darling, G.
Gillies, D. A.
Houston, Miss M. B.
Hutchinson, Miss A.
Klingenhagen, Miss A. M.
Le Sueur, Miss E. D.
Pearce, Miss M.
Slee, J. N. H.
Smith, B. S.
Sutherland, E. G.
Watson, Miss H. W.
Yeigh, Frank.

July 8th.
Adams, Miss C. E.
Anderson, G. A.
Ballantine, A. B.
Craig, H. S.
Foote, Miss A. G.
Hugg, Miss A. M.
Hunt, W. G.
Irvine, Miss H. S.
Lally, C. T.
McClelland, K. D.
McFarlane, Miss M.
McKitterick, M. T.
Paterson, Miss M. E.
Patterson, Miss M. E.
Springate, Miss M.
Walker, F. C.
Walker, W. J. S.

July 9th.
Lennox, Miss M.

July 10th.
Barnes, E. M.
Barnes, Miss L.
Boardman, W. W.
Copeland, C. H.
Lindsay, L.

ON MOUNT TEMPLE.

July 4th.
Sutherland, D. A.

July 6th.
Duval, Miss L. E.
Graham, T. H.
Herdman, F. W.
Humme, P. M.
McKay, Miss H.
Morrison, J. C.
Morrison, Mrs. J. C.
Schofield, E.

July 8th.
Thomas, A. V.

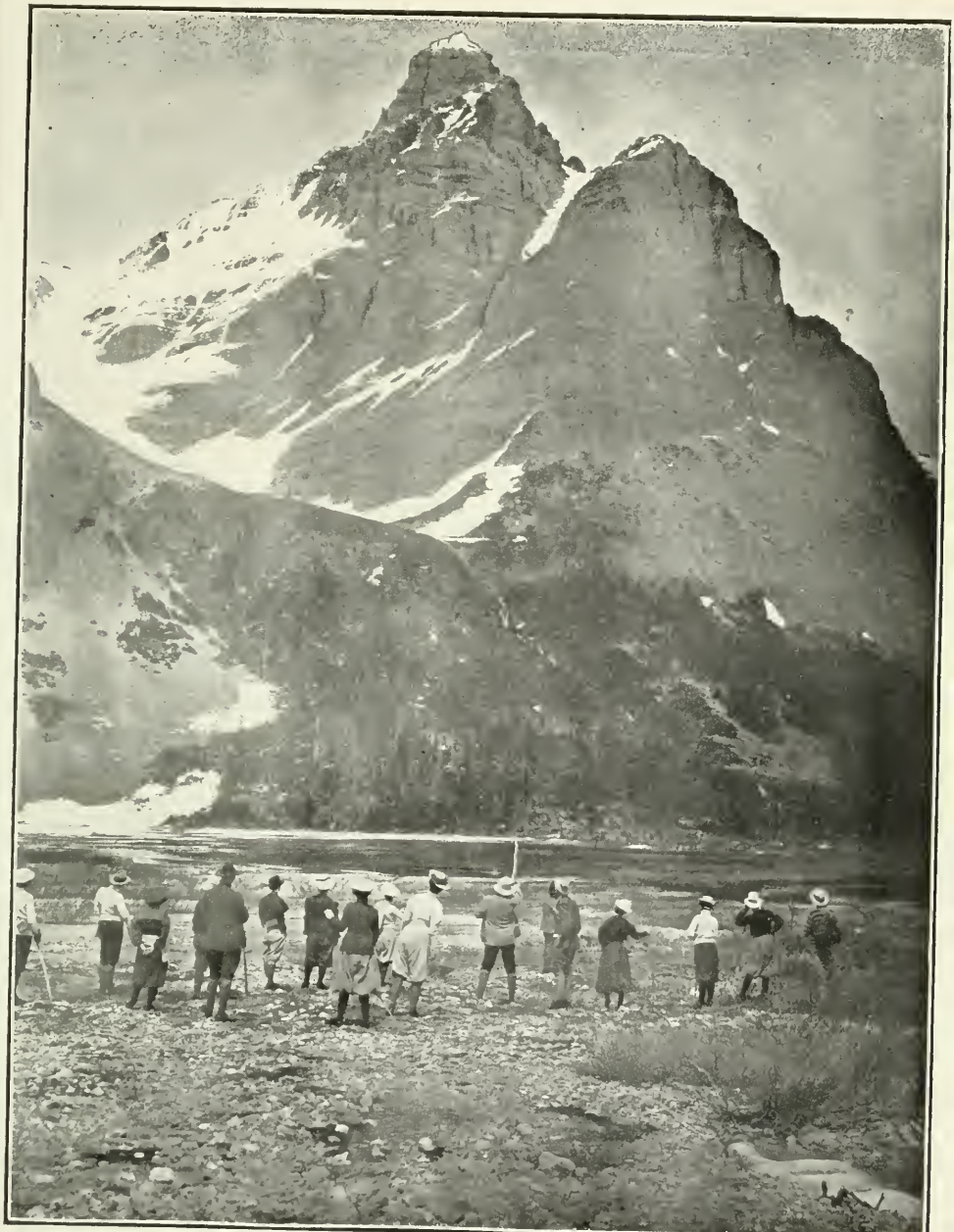
July 9th.
Dewey, T. C.
Fiskin, A. D.
Goddard, M.
Hunt, J. S.
Overend, F. C.

July 11th.
(On Mt. Fay)
Haggith, Rev. W. J.

MOUNT ABERDEEN.

(10,340 ft.)

The ascent of Aberdeen was commenced at the Main Camp. The parties followed a small watercourse immediately in the rear, to above timber-line, and then ascended steep shale slopes



Byron Harmon, Photo

MOUNT ABERDEEN FROM PARADISE VALLEY

Copyright. 1902, by Detroit Photographic Co.

MOUNT TEMPLE AND PARADISE VALLEY, ALBERTA

and rock slides to the foot of some perpendicular cliffs of the shoulder, seen directly above, from the Camp. The first parties reached the top of these by an interesting climb up a small chimney and then followed the arete of the final slope. This consisted of a steep snow ridge, leading straight to the summit, which, though requiring care, offered no special difficulty.

After the first two or three days the chimney to the top of the cliffs became slippery with ice owing to the melting snow freezing at night, and, to avoid this, a short detour was taken to the left and the ascent to the arete made at a point about half way between the shoulder and the summit.

The return was by a different route, the parties descending to a low part of the ridge, south of the summit, at head of a long snow-filled couloir. From this point one continuous glissade of nearly 2,000 feet carried the climbers to timber-line. A short tramp over grassy slopes to the watercourse ascended in the morning brought them quickly to the Camp.

MOUNT TEMPLE.

(11,626 ft.)

Leaving Camp for Mt. Temple, the parties followed the trail up Paradise Valley for a short distance, and, turning to the left, climbed some steep timbered slopes reaching to the base of the southwest shoulder of the mountain. The path then lay over grassy ridges and fallen rocks to the foot of Sentinel Pass. A steep snow slope led to the summit of the pass and offered no greater difficulty than that of cutting steps if the previous night had been cold. After this the route followed was up steep shale slopes, rockslides and snow-filled couloirs till the final arete was reached. The arete, leading directly to the summit of the mountain, was precipitous and very heavily corniced on the side next Moraine Lake. The only precaution necessary was to avoid going too near the edge.

The descent was made by almost the same route, the only variation being, that when possible, glissades were taken down snow slopes instead of climbing down the rocks.

EIFFEL PEAK.

(10,091 ft.)

On July 4th a party in charge of the Swiss guide, Peter Kaufmann, made the ascent of Eiffel Peak, which is joined to Pinnacle Mountain by a short arete. No details of this climb can be given owing to the records having been lost, as explained below in the report of the Camp Committee.

PINNACLE MOUNTAIN.

(10,062 ft.)

This peak, but little over 10,000 ft., has proved a veritable surprise. Three separate parties tried to make the summit during the summer of 1907 but returned vanquished.

The first attempt was made on June 4th by Mr. J. P. Forde and the guide, Peter Kaufmann. The second was on July 9th by the Rev. J. C. Herdman, Rev. G. B. Kinney, Rev. J. R. Robertson and P. D. McTavish, in charge of the Swiss guide Edouard Feuz Jr.

Later during the summer Dr. Hickson with the two guides Edouard Feuz Jr. and Gottfried Feuz made the third and last attempt for the year, without success.

As a full account of the three climbs is given in the mountaineering section of this number, nothing further need be said here.

MOUNT FAY.

(10,612 ft.)

On July 11th a party in charge of the guide Gottfried Feuz made the ascent of Mt. Fay (formerly "Higi", No. 1 of the Ten Peaks) from the camp at Moraine Lake. On this climb the Rev. W. J. Haggith of Banff graduated.

MOUNT VICTORIA.

(11,355 ft.)

An attempt was made on July 11th to reach the summit of Mt. Victoria, although it was early in the season for climbing this snow-clad peak. The party was in charge of the guide Edouard Feuz Jr. Crossing the Mitre Pass from Paradise Valley it rounded the shoulder of Mt. Lefroy and ascended the Victoria Glacier to the crest of Abbot Pass. From here the party climbed the shoulder above the pass and reached the arete leading to the summit, but, owing to the bad condition of the snow and lack of time, failed to reach the final peak. The return was made that night to the C.P.R. chalet at Lake Louise.

A word for the future: It is advisable that members coming to the Annual Camps should bring their own ice-axes or alpenstocks. It has been found that the demand is greatly in excess of the available supply, and on each expedition some have to go with makeshifts. This fact renders it unsafe for the whole party. Ice-axes should be ordered through the Executive Committee not later than March of each year. The cost of an ice-axe with the owner's name stamped upon the steel head is about $5.00. It is pleasing to note that many members are taking advantage of the opportunities offered by the Club to obtain these indispensible mountaineering implements, and at least fifty must now be in the possession of its members.

M. P. Bridgland, Chief Mountaineer.

The above report sets forth shortly a statement of the mountaineering done during the meet. Unfortunately, the Camp papers were lost while in transmission from Winnipeg to Calgary, the piece of baggage in which they had been placed having been stolen. In consequence the details of the various climbs, such as times, routes, etc., have been omitted.

H. G. Wheeler, Photo

PINNACLE MT. FROM PARADISE VALLEY

EXPEDITIONS.

A number of expeditions were arranged daily, and two auxiliary camps placed at outside points: one at Lake O'Hara and one at Moraine Lake.

Chief among the expeditions was that encircling Mts. Lefroy, Ringrose and Hungabee. The route was a full twenty miles in length and occupied two days. It crossed five mountain passes—the Mitre, Abbot, Opabin, Wenkchemna and Sentinel; and traversed five glaciers—the Lefroy, Victoria, Opabin, Wenkchemna and Horseshoe. It was distinctly strenuous and presented some good phases of mountaineering while crossing the passes and traversing the glaciers. A half-way stop was made at the O'Hara Camp. An account of this expedition will be found in another part of the Journal, entitled "Expedition to Lake O'Hara." Four such expeditions started from the Camp and returned safely, sometimes reversing the order of route and going by the Wastach Pass.

A favorite but less strenuous expedition was the encircling of Mt. Temple, via the Sentinel or Wastach Passes—the former between Mts. Temple and Pinnacle and the latter between Eiffel Peak and Mt. Hungabee—and the Valley of the Ten Peaks. A night could be spent, if desired, at the Camp placed at the foot of Moraine Lake, and the following day the expedition extended up Consolation Valley and a visit paid to the two beautiful lakelets near its head, the upper one distinctly a glacial lake. The bright sunshine bringing out the golden yellow of the meadows, for spring had hardly commenced here, the deep green of the surrounding pine forest, the dark grey rock and the white snow, with the reflection of the surrounding peaks intensified in the placid surface of the lakes, made this minor expedition one of very great delight during the fine weather of the Camp. The Moraine Lake Camp was reached from both directions: those who were not ardent mountain-climbers going by trail and then returning via Larch Valley and Sentinel Pass, or, proceeding up the Valley of the Ten Peaks, by the Wastach Pass, or simply returning by trail as they had gone.

There were a number of minor one-day expeditions in the valley itself: (1) To Lake Annette, perched at timber-line on the western slopes of Mt. Temple, a lakelet of brilliant green, most beautifully picturesque in its surroundings. The expedition was a great favorite. (2) To the Horseshoe Glacier at the head of the valley. It is to be regretted that, owing to the heavy snowfall of the previous winter, the entire surface of the ice was covered and in consequence the usual interesting features of a glacier were hidden. The covering of snow also prevented observations for advance or retreat being initiated, as had been intended. Notwithstanding this, the visitors to the Camp seemed to like going up on the neve to enjoy the delights of glissading down the steep stretches of the forefoot. Two or more parties would be sent out daily. (3) Not far from the Camp were the "Giant's Stairs," where the western branch of Paradise Creek leaps wildly down ledges of rock so symmetrically carved out that, when the stream is at a low stage, the bed at this place looks like a gigantic stairway. During the period of the Camp

the water was at a fairly high level and the effect, as it tumbled over the ledges in sheets of foam and flying spray, was picturesque in the extreme. It was seldom that members of the Camp were not to be found at this spot, and especially was it the haunt of the exponent of the camera.

Taken as a whole the Second Annual Camp of the Alpine Club was a brilliant success and much advancement was made in the science of mountaineering. The peaks climbed were of a more difficult type, and a keeness and zest were shown for work that was most pleasing. Added to this the full attendance throughout the week spoke for the popularity of the work being done by the Club, and the fact that many of the members there hailed from other countries proclaimed the worth of the Canadian Rockies as a field for alpine research and recreation.

RECEIPTS AND EXPENDITURES PARADISE VALLEY CAMP, 1907.

Receipts.

Grant from Alberta Government	$ 500.00
Receipts for Board and Accommodation	1230.00
Paid in for distribution among employees	90.00
Sale of ice-axes, drinking cups, snow glasses, etc.	116.35
Surplus supplies sold	7.85
	$1944.20

Expenditures.

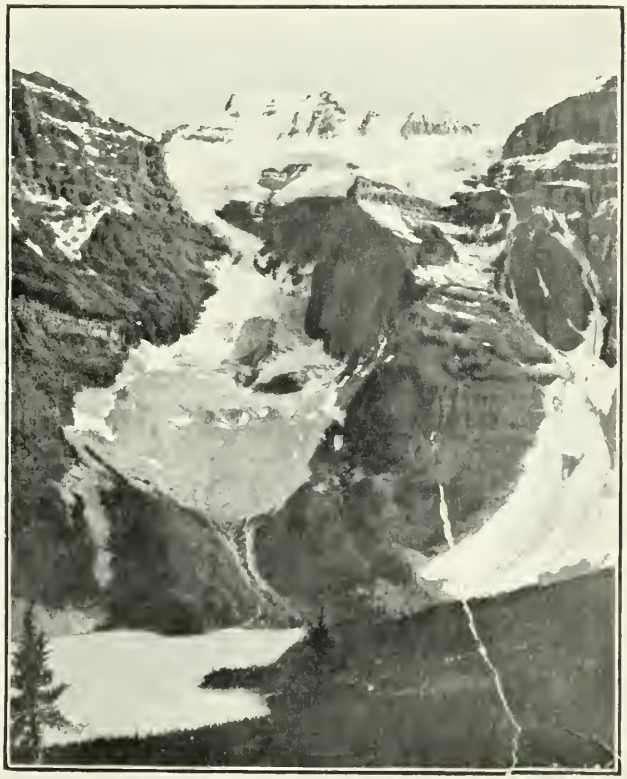
Expense Account	$1587.30
Paid for Ice-axes and Alpen-stocks	103.55
Distributed among employees	90.00
	$1780.85
Balance to credit	$ 163.35

Balance applied on account of first issue of Canadian Alpine Journal.

Arthur O. Wheeler,
Chairman of Camp Committee.

J. D. Patterson, Photo

THE GIANT'S STAIRS



Howard Palmer, Photo

MT. FAY, VALLEY OF THE TEN PEAK